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JANUARY, 1971

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THE HEALTH BULLETIN

The Official Publication Of The North Carolina State Board of Health



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THE HEALTH BULLETIN

Editor
Clay Williams

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On the Cover

Emergencies vary greatly as regards their severity. The general public's assumption that all hospitals can render complete emergency care leads to the loss of valuable time in obtaining care where facilities and staff are more readily available. It is incumbent upon each hospital, however, to provide emergency care in accordance with the services each is staffed and equipped to furnish.

COMMENT



Medicare... Success Or Failure

By
Ernest Phillips
Chief
Medicare-Medicaid Section

Critics of Medicare have charged that the program is too costly, that it fails to meet the health needs of those over 65, and that services are not always available when needed.

Medicare has been a costly program, but it has been more of a victim than a cause of the tremendous increase in medical care costs. The extension of minimum wage laws to hospitals and nursing homes, plus inflation, bear more responsibility than Medicare.

Medicare does not meet the total health needs of those over 65, but it never intended to. Medicare is an insurance reimbursement program. It has the coverage limits, the deductibles, and the co-insurance clauses of any insurance policy.

Medicare does not deliver care. It only pays a stated share of the costs. Services such as home health services may not be available in some areas, but to charge the Medicare program with the responsibility for developing such services is unrealistic.

It is time we admitted that in terms of its original objective of improving the health status of our older citizens, Medicare has been a great success. Medicare has lifted the burden of medical expense from that segment of our population less able to bear such expense. Without Medicare, many would have their life savings disappear in the course of one catastrophic illness.

It is also time to look at Medicare for what it is—a prepaid insurance plan. It is not a welfare program. It is not a government giveaway program. Those who benefit have paid premiums in the same way they would to Blue Cross.

Medicare a failure? Not to the thousands in North Carolina who have benefited from it. To them it has been, and remains, an overwhelming success.

A 34 year-old man has a convulsion while driving his car and has a wreck.

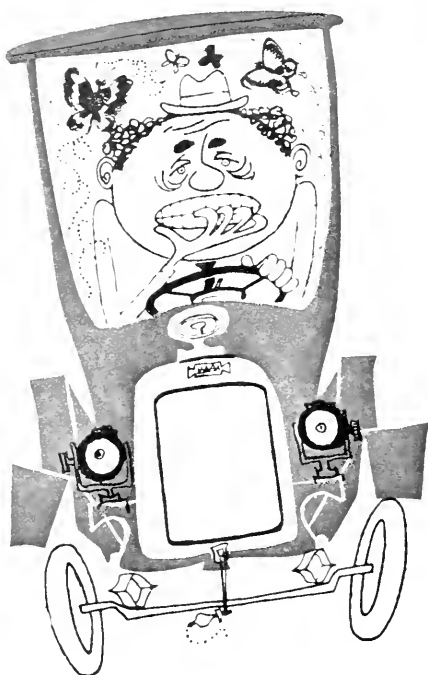
A 45 year-old man develops "gun-barrel vision" because of a progressive eye disease and, because he cannot see what is coming at him from the side, is involved in a two-car collision at an intersection.

A 39 year-old woman has been taking a tranquilizer prescribed by her physician and, even though he cautioned her about possible side-effects, she becomes drowsy at the wheel and has a wreck.

Each of the persons described above has a medical condition affecting his or her safety and the safety of others when the individual gets behind the wheel of a car and drives. While the great majority of people with chronic medical conditions can drive safely, several conditions such as uncontrolled epilepsy, vision problems, uncontrolled diabetes, certain types of diseases affecting the heart and blood vessels, and severe forms of illness do affect a person's driving ability. The single medical condition of greatest importance in highway safety, however, is the abuse of alcohol.

Studies conducted in a number of states have repeatedly shown drinking drivers to be responsible for at least half of all fatal automobile accidents. To get the drinking driver off the road, however, is easier said than done. Evaluation of patients receiving

are you FIT TO DRIVE?



By
Dr. J. N. MacCormack
Chief
Communicable Disease Section

treatment for alcoholism is an oblique and incomplete approach to the problem since it does not reach those drinking drivers who do not seek or are not coerced into seeking treatment. As Dr. Julian Waller, a recognized expert in the field of highway safety, has pointed out, taking the drinking driver's license is also an incomplete answer since alcoholics—more than any other group—often continue drinking and driving whether they have a license or not. A combined law enforcement and treatment program may be the answer.

In an attempt to do something about the problem of medical conditions affecting driving, the Medical Society of North Carolina working with the North Carolina Department of Motor Vehicles established, in 1964, a program to medically evaluate drivers. The State Board of Health has been involved in the program since 1968.

Drivers suspected of having significant medical conditions affecting their ability to drive safely are referred by driver license examiners, law enforcement officers, court officials and physicians for evaluation. The individual is asked to have his or her physician complete a special medical report form which is sent by the physician to the Department of Motor Vehicles. The report is screened at the State Board of Health by a physician and, if necessary, additional medical information is obtained. The case may then be

reviewed by a panel of practicing physicians from the same area of the state in which the subject lives. The panel reviewing a case recommends either approval of the individual's driving license privilege, approval with certain restrictions, or disapproval and then the Department of Motor Vehicles acts accordingly.

A person whose driving privilege has been disapproved by one of the panels can appeal his or her case to a Medical Review Board. This board meets in Raleigh on a regular basis to hear these appeals, and the individual whose license has been denied appears in person before the board.

The goal of the Driver Medical Evaluation Program is to reduce accidents by either removing from the highways those drivers medically unfit to drive or by restricting drivers with lesser degrees of medical impairment to reduced speeds, daylight driving, etc. A sizable number of the cases evaluated by the program are fairly obvious as to whether the individual's medical condition would interfere with driving, but a large percentage of cases are not so obvious. It is necessary to bear in mind that the removal or even restriction of a person's driving privilege may seriously interfere with his or her livelihood. This factor must be balanced against the danger inherent in the decision to permit a medically unqualified driver to continue driving. Such decisions are often hard to make.

Drug Action Group Formed

Following a growing trend throughout the country by groups concerned with the drug problem, 12 persons with varied backgrounds recently formed the Drug Action Corporation of Wake County. The objective of the organization is to initiate a comprehensive program designed to bring about control of the illegal use of drugs in Raleigh and Wake County.

The group suggests that citizens of North Carolina must resist delegating exclusive responsibility to law enforcement and medical authorities for the solution of problems surrounding the use of illegal drugs. The urgency for bringing drug abuse under reasonable control demands a strong coordinated effort by all segments of our citizenry. Pursuing this concept, the Wake County Mental Health Association organized a series of discussions among interested adults, from which the Drug Action Corporation was conceived.

The broad purposes of the program are to:

- Conduct an appropriate education program for adults, youths, adolescents and children—employing all forms of communication.
- Provide advice, assistance, and when necessary, physical and mental treatment for

abusers of drugs and chemicals.

- Coordinate the efforts of individuals and organizations.
- Operate a research program.
- Cooperate with law enforcement agencies when laws are violated and counsel individuals referred to the program by law enforcement agencies.

Specifically, the aim of the organization is to find out how big the problem is in the community, who the addicts are, what drugs are being used, how frequently and whether the user has had any bad experiences.

At present the corporation is being financed by grants from civic organizations and interested individuals. The program, if it is to reach its full potential, will require at least partial financial support from county, state and federal governmental sources.

The corporation has established a house in Raleigh which serves as a point of contact with persons who have been part of the "drug subculture." Individuals who have drug problems may come to the house or call. The voluntary staff, which has had basic training in medical and psychiatric emergency care, will attempt to determine the nature of the problem and provide help accordingly. The organization is working closely with adult rela-



Some of the officers of the Drug Action Corporation of Wake County are (left) Dr. Harold W. Glascock, Jr., vice president; Mrs. George Bason, secretary-treasurer and board member E. L. Raiford. The board is comprised of 12 members.

tives of illegal users and other interested adults.

Private physicians have volunteered to provide psychiatric and medical support. The Wake County Mental Health Center and Dorothea Dix Hospital, along with the emergency services at Rex Hospital and Wake Memorial Hospital, are cooperating in the effort. A panel of lawyers have also volunteered their support. The local law enforcement agencies are also assisting in the program.

Future plans call for a methadone treatment program for heroin users, an outreach program to bring users in for treat-

ment, another acute treatment house, a chronic treatment facility, and a resocialization and rehabilitation program.

"As a private corporation, the program will move toward these objectives as rapidly as financial support can be obtained," says Dr. Harold Glascock, vice president.

Similar groups in other communities are attempting to band together in an effort to approach the drug problem on a co-ordinated basis. Interested persons may contact Dr. Glascock, at Dorothea Dix Hospital in Raleigh for additional information and ideas.

One of the most critical problems facing hospitals and other health care institutions in North Carolina at the present time is the shortage of professional health manpower to staff the medical facilities in our state. There is a severe shortage not only of physicians and nurses, but also physical therapists, pharmacists, laboratory personnel, x-ray technologists and many other types of health professionals needed to staff a modern hospital.

To combat this manpower short-

ly of encouraging young people in the junior and senior high age groups to consider a career in the health field. Members of the secondary educational community—including guidance counselors and teachers—have provided valuable assistance by distributing materials prepared by the Health Career Program.

To spark the interest of young people in a health career, 200,000 copies of a brochure, "IN Careers for the NOW Generation," have been

Health Manpower Shortage Critical

age, the N. C. Hospital Association, composed of nearly all of the general medical hospitals in North Carolina, maintains a Health Careers Program, whose purpose is to explain the opportunities and rewards of a career in the health field to the people of the state.

The small staff of the Health Career Program consists of John Marston, program coordinator; Miss Betsy Haines, field representative; and Mrs. Margaret Cornpropst and Mrs. Lee Noell, secretaries.

The program undertaken by the Hospital Association consists most-

ly distributed around the state this year. The response has been excellent. The Health Careers Program now receives a daily average of 70 postal reply cards from young people asking for information on specific health careers.

A useful service the Health Careers Program renders to colleges, universities, technical institutes and hospitals is the distribution of names of young people who have expressed interest in a health career. These educational institutions, in turn, follow up with recruitment material about their own health

training programs. Replies from a recent questionnaire indicated that about 100 of these health training programs around the state are using the Health Manpower Pool as a recruitment device for their own schools.

Another activity is sponsorship of the Health Careers Clubs of North Carolina, a statewide organization of approximately 100 junior and senior high school clubs comprised of young people interested in pursuing a career in health. These

plus a panel on drug abuse, which included Charles Dunn, director of the State Bureau of Investigation.

The Health Career staff works with officials of many allied health organizations in a cooperative effort to promote health careers. Some of these include hospital auxiliaries in the state, the Auxiliary to the State Medical Society, the N. C. Summer Experience Program, and many other state and private agencies.

Other programs in which the



... notables speak for the Health Careers Program

clubs meet periodically in their schools, go on field trips to hospitals and other institutions, and each year send delegates to the Annual Health Careers Clubs Congress in Raleigh.

This past March, 300 health careers clubs' members and their advisors attended the ninth annual Health Careers Clubs Congress, which included addresses by such notable health figures as Dr. Jacob Koomen, State Health Director; H. C. Cranford, Jr., vice president of N. C. Blue Cross & Blue Shield, Inc.;

Hospital Association has participated include providing information to discharged servicemen who have had military health training, working with the Boy Scouts of America in the establishment of Medical Specialty Explorer Posts, distribution of films and filmstrips and promotional materials to the news media.

Persons, youth or adult, desiring more information about how they can enter the health field, are encouraged to write Health Careers, P.O. Box 10937, Raleigh, N. C. 27605.

Crisis In The Emergency Room

not be treated in an emergency room.

During a 24 hour period on a recent weekend, 104 persons entered the emergency department at Wake Memorial Hospital in Raleigh for treatment. Only 48 were termed emergency patients. The rest, most of whom were in no immediate danger, clogged waiting areas and passage ways and vented periodic fits of anger on nurses who were powerless to

The battle against death, the high drama that unfolds repeatedly in emergency rooms of hospitals throughout North Carolina and the nation, is often overshadowed by inadequate equipment, cramped quarters and a harried staff trying to cope with an avalanche of patients whose emergency consists mostly of an assortment of minor ailments that should be treated elsewhere.

An eight-hour stint observing activities in the emergency room of a large hospital recently pointed up the futility of attempting to meet the clinical medical needs of large numbers and the emergency needs of a few—at the same time. It is evident there exists widespread misunderstanding of the role of the emergency rooms and their limitations in providing convenient and comprehensive medical care. It is obvious, too, that sore throats, headaches, colds, coughs and diarrhea should



... they wait . . . wait . . . wait



**... a drunk driver loses
a bout with a tree**

give them the attention they demanded.

In a recent study of emergency services in hospitals throughout the state by the N. C. Medical Care Commission, it was determined that the increase in volume of patients, coupled with the shortage of health manpower, presents a massive problem that is threatening to overwhelm existing emergency resources. Each day more than 3,000 persons seek medical attention in hospital emergency rooms in the state; over half of these visits are estimated to be non-emergency in nature.

Emergency suites at one time were strictly accident treatment

rooms but not any more. While accidents are still a major cause for emergency room visits, illnesses such as coronary attacks, ulcers, poisonings, psychiatric crisis and pregnancy are also among the reasons for seeking medical services in an emergency room. Sandwiched in between acute emergencies are a constant stream of visits which must be termed "emergency room abuses." The patient who doesn't want to bother his doctor, who mistakenly believes his insurance will pay for all emergency room visits and who assumes he can be seen quicker, who has never made an attempt to obtain a regular doctor, the patient referred to the emergency room by his doctor—all have caused to be visited upon medical authorities and civic leaders a calamitous medical crisis.

The Medical Care Commission study noted that the quality of care available in North Carolina, in most cases, is directly proportional to the availability of physicians qualified to cope with emergency illness and trauma. The distribution of physician manpower varies widely within the state, favoring the more populous areas. Nine counties in the state have only one doctor per 5,000 people, 22 counties have five or less doctors and eight have only one doctor each. In these days of 500-passenger jumbo jets, of highways saturated with cars and buses, rapid transit from Manteo to Murphy, it is not a pleasant thought to note that in some coun-



... a baby falls
from her crib

ties chances of surviving a serious medical crisis are very slim. Nearly one-third of all hospitals in the state have no personnel specifically assigned to the emergency room.

It is in the emergency room that the most vital decisions are made, and a good emergency room should be staffed with specially trained doctors and nurses—as well as a backup corp of specialists. Prompt assessment and treatment is one of the best assurances of recovery from either sudden sickness or injury.

The traditional concept of an ambulance service taking a patient to the nearest emergency room just because it is the nearest

is neither in the best interest of the patient nor the providers of service, according to the Medical Care Commission's study. The general public's mistaken assumption that all hospitals can render complete emergency care leads to the loss of valuable time in obtaining care where facilities and staff are more readily available.

In lieu of requiring all hospitals to have emergency rooms, the Medical Care Commission has advanced a proposal which classifies hospitals according to the scope of care they are capable of providing and which requires that only a described level of care be provided at a particular hospital. Patients would be assured of getting the care their condition merits at a facility adequate for that purpose. Officials, the study suggests, must inform the public as to the various levels of emergency care available at different hospitals.

The commission's report also suggested a proposed plan whereby emergency service would be centralized within areas of regions. Specifically, the plan envisions coordinated emergency services around a nucleus of a few highly competent medical centers—a network of hospitals across the state with certain defined geographical areas of responsibility wherein designated hospitals would be the primary providers of emergency services for more serious emergency cases.

Closely allied to any effort to bring the state's citizenry better



... a drug addict on a bad trip

emergency medical service are the dual needs of better trained ambulance attendants and two-way radio communications with emergency vehicles and hospitals. Until recently, the advantage of radio communications was greatly overlooked in North Carolina. Pursuing the concept further, a helicopter ferrying seriously injured persons, directed by sophisticated communications equipment, must be considered in upgrading emergency medical service.

Prior to implementing any uniform plan of emergency medical service, clinics must be provided

for patients who do not have the initiative or ingenuity to seek routine medical treatment in the conventional way. Doctors must inform their patients that an emergency room is not the place to treat the spectrum of minor aches and pains. Doctors, themselves, often add to the dilemma by referring patients to the emergency room for treatment or for medicine that they have called in.

Emergency rooms can function in the manner intended only if that segment of our citizenry who clog its facilities is provided an alternative means of routine medical care.



Marshall F. Palmer (right), superintendent of the Apex water plant, recently received the "Water Plant Operator of the Year" award at ceremonies at the State Board of Health in Raleigh. The award is presented each year to the operator who exhibits outstanding service and dedication to the waterworks industry. Palmer's name will also be permanently inscribed on a plaque situated in the state health agency's Engineering Division in Raleigh. On hand for the presentation were J. M. Jarrett, (left), former director of the Sanitary Engineering Division and M. M. Harris, superintendent of the Elizabeth City Water Plant and chairman of the N. C. Waterworks Association.

It is not every day that we are privileged to have the Health Bulletin saluted in verse. We, therefore, feel obligated to share with you the effort of Mr. Henry Smith of Oakboro, N. C.

"The Health Bulletin"

Read The Health Bulletin that is sent to you,
it contains helpful information in every issue.

In an emergency be informed as to what to do,
and the most modern methods to doctor the flu.

Insist that youngsters read The Health Bulletin too,
and learn the harmful effects of sniffing glue.

Medical journal reports are important and true,
and not the opinion of perhaps only one or two.

Read about some health problems somewhat new,
this information is known by only a very few.

Then health and happiness let's all pursue,
I'm sure every American will share this view.

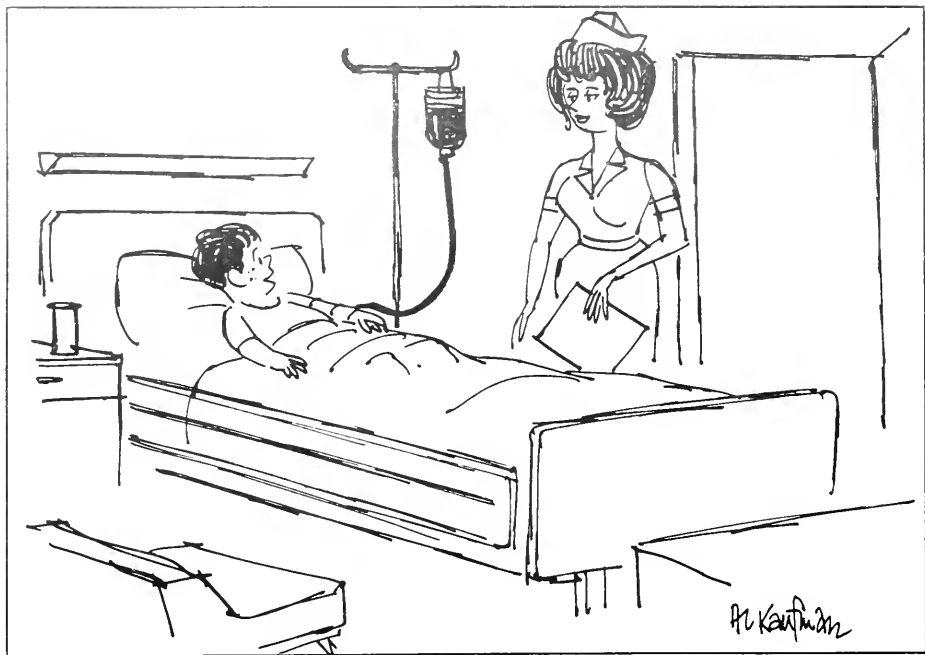
Drug abuse in America we should try to subdue,
and look to The Health Bulletin to give the cue.

So, let's all be alert and look for any clue,
because the problem of narcotics is not taboo.

State Of North Carolina Vital Statistics Summary

	October 1970	Year to Date 1970
Births	8,654	81,385
Deaths	3,609	36,988
Infant Deaths (under 1 year)	187	1,957
Fetal Deaths (stillbirths)	142	1,361
Marriages	3,385	40,026
Divorces and Annulments	1,313	11,419
Deaths from Selected Causes		
Diseases of the heart (all forms)	1,275	13,206
Cancer (total)	534	5,472
Cancer of trachea, bronchus and lung	90	1,043
Cerebrovascular disease (includes stroke)	412	4,447
Accidents	267	2,683
Motor vehicle	153	1,372
All other	114	1,311
Diseases of early infancy	115	1,159
Influenza and pneumonia	114	1,409
Bronchitis, emphysema and asthma	54	581
Arteriosclerosis (hardening of arteries)	50	508
Hypertension (high blood pressure)	32	210
Diabetes	67	673
Suicide	47	448
Homicide	61	520
Cirrhosis of liver	73	552
Tuberculosis, all forms	9	115
Nephritis and nephrosis (certain kidney diseases)	16	199
Infections of kidney	29	235
Enteritis and other diarrheal diseases (stomach and bowel inflammations)	11	83
Ulcer of stomach and duodenum	11	112
Complications of pregnancy and childbirth	4	28
Congenital malformations	36	388
Infectious hepatitis	—	8
All other causes	392	3,982

Marriages, divorces and annulments are by place of occurrence, all other data are by place of residence.



"How do you know when I'm full?"

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On the Cover

Dr. Jurgelsky removes an opossum from a nest box in the building developed at the National Institute of Environmental Health Sciences to house the opossum breeding colony. Individual cages and nest boxes are seen to either side. In order to avoid a painful, and often severe bite on the hand, the animals must be restrained by quickly and firmly grasping the nape of the neck.

COMMENT

public health and the "public"



Dr. Drake

By
Dr. Ben Drake
County Health Officer
Gaston County

It has been said that "Public health is 90 percent education and 10 percent sanitation." This statement, which was made years ago, is doubly true today. Education in matters of disease prevention and community health should be uppermost in the thinking of all public health workers because of more pronounced needs and concern of health consumers. Today decisions are not and should not be made by "providers" alone, but also by the persons who are paying the bills—persons who are receiving the services. They should be made aware of community health problems and ways and means of alleviating them. They should know what is involved when decisions are to be made. They should know what steps are to be taken to prevent the spread of disease, to prolong life, to reduce infant mortality, to care for the chronically ill, and to improve the quality of the environment. Without this knowledge the public might well be opposed to the use of public funds for these purposes. They might well object to certain needed procedures, whereas, if the public is educated, these problems are much more easily solved. When citizens are fully apprised of collective endeavors they usually respond favorably. We may very well give the above quotation the top priority in our thinking of how to provide a good public health program to the people of North Carolina.

Opossum a Laboratory Animal?

Half-formed with undeveloped stubs for hind legs, a brain only partially complete, and many of its other organs just beginning to grow, the baby of an experimental laboratory animal emerges from its mother's birth canal late on a cold winter night.

Barely one-half inch long and 5/1000 ounce in weight, it wriggles blindly amid the forest of hair on its mother's belly, as it searches for a nipple the size of a pin head. Finding the nipple, it begins to nurse. Within a few days its jaws fuse so that the infant animal cannot release the nipple. In this state, protected from the outer world by a warm moist envelope of its mother's skin, it completes, over a period of 2½ months, much of the growth which in other animals takes place in the womb.

The animal, not a product of science fiction but an 80 million year old experiment of nature, is known to science as *Didelphys marsupialis* but better known to North Carolinians as the 'possum. Thrust into the world only 12 days

after conception, it is sufficiently immature at birth to be considered a kind of naturally occurring "test tube" baby.

The smelly, hissing, nasty-tempered scavenger of Southern woods—reviled by man and given a wide berth by predators—has, in recent years, been accorded station with the rat, guinea pig and hamster as a laboratory model—thus, after a fashion, letting nature off the hook.

In studies being conducted by Dr. William Jurgelsky at the National Institute of Environmental Health Sciences, Research Triangle Park, this "abortion which has learned to survive outside the womb," is being developed as a powerful biomedical tool to provide a better understanding of how the developing fetus responds to harmful agents in the environment.

"Eventually its use may supplement standard techniques in the study of specific problems difficult or impossible to approach



The newborn opossum lying on the card is about a half inch long, weighs 5/1000 of an ounce, and is no bigger than a bee. It is actually smaller than the mother's toe. A litter of 13 opossums will fit into a teaspoon at birth. The adult animal is about one year old and weighs 8½ pounds. The opossum gains 1,000 times its weight by the time it leaves the mother at three months of age. At maturity, at about one year of age, the opossum's weight has increased by another 24,000 times.

in the pregnant animal," Dr. Jurgelsky said.

"The newborn opossum is much like a two-month old human fetus in its ability to serve as a unique animal model for testing the effect of suspected toxins on infant develop," the research pathologist revealed.

"While it cannot replace the

usual pregnant laboratory animals such as the rat or mouse in these experiments, especially in the study of the early stages of fetal development, the opossum's semi-embryonic state at birth does give it special advantages where direct studies on growing embryonic tissue in the later stages of fetal development are desired.

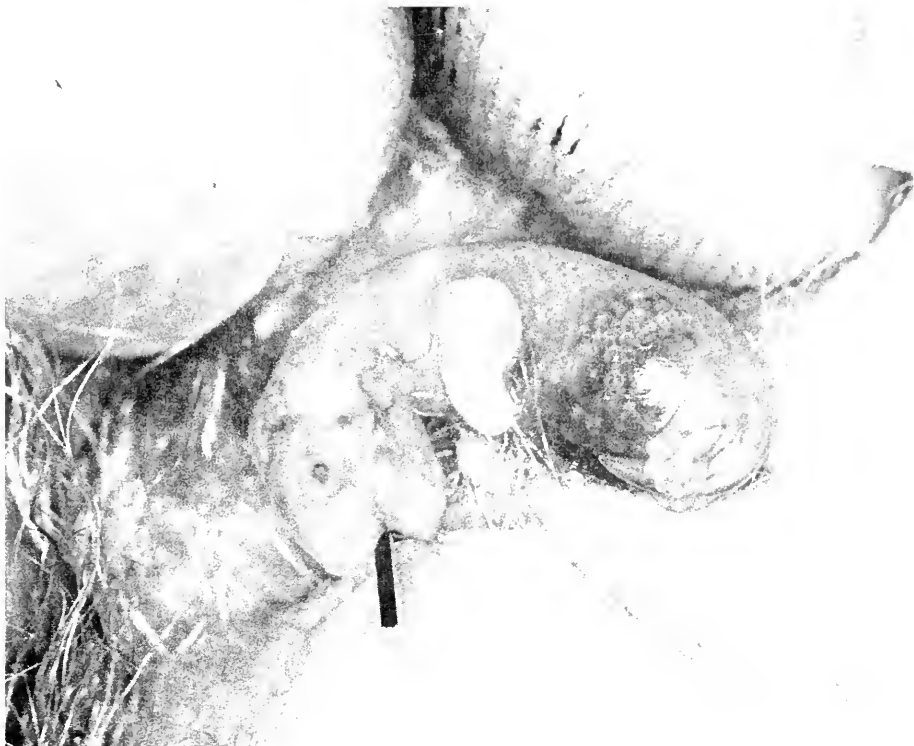
"The major advantage of the newborn opossum is that while still in part embryonic, it is in fact independent of its mother except for the milk it drinks and the protection of the pouch. A rat or mouse equivalent in maturity to the newborn opossum is only half-way through gestation and still in its mother's womb. To experiment on it, the investigator must either feed the test material to the mother, risking both damage to her and alteration of the material by her system, or he must remove the embryonic animal surgically, a very unnatural procedure which obviously cannot be repeated often on the same animal. In the opossum growing embryonic tissue is directly accessible simply by opening the mother's pouch."

In one series of experiments underway in Dr. Jurgelsky's laboratory, the newborn opossum is being used to gain a better understanding of childhood cancer, next to accidents the leading killer of children. Shortly after birth, the tiny opossums are given a single dose of potent cancer agent through a threadlike plastic tube inserted in their mouth next to the mother's nipple. As expected, the majority of the animals develop cancer of the brain within three to four months. But of these, Dr. Jurgelsky was surprised to find that a number also have birth defects, a rare coincidence in other laboratory animals, implying that the opossum may be an ideal animal to use in unraveling

the long suspected relationship between cancer and developmental defects.

In a second investigation, Dr. Jurgelsky is using the newborn opossum to learn more about the manner in which toxins, entering the mother during pregnancy, damage the thyroid gland. "In most animals thyroid function begins in the womb where it cannot be studied without affecting the mother. The opossum appears to be better suited to this work because its thyroid gland does not begin to function until about one week after birth, when it can be studied independently of the mother. In one experiment a weedkiller, which has been shown to produce goiter and thyroid cancer in laboratory animals, is being fed to the newborn opossum at high doses in an effort to determine how it produces injury to the thyroid.

"The opossum newborn, because of its markedly undeveloped nervous system at birth, also appears to be an ideal animal model in which to investigate alterations in brain growth and function caused by exposure to environmental toxins during early growth. In a study in progress, opossums injected with one such agent, once per week from birth, develop spontaneous seizures. These seizures, which are similar to those seen in human epileptics, can be triggered in the opossum simply by gently raising and lowering the animal's front feet from the table top. The ease with which



A newborn opossum attached to a nipple in the mother's pouch is being given a drug through a fine polyethylene tube inserted into its mouth. The baby opossum sucks the material (black region of tube) from the tube as he nurses, just as a human baby drinks from a bottle. This special technique, developed by scientists at the National Institute of Environmental Health Sciences, is necessary since the baby will die if removed from the mother's breast before 2½ months of age. Tips of thumb and forefingers of the investigator are visible to the right.

the opossum develops seizures in response to this toxin may make the animal of considerable value in understanding human epilepsy," Dr. Jurgelsky said.

Experimental work is only half the story of the opossum colony at the Institute. According to Dr. Jurgelsky, experiments using newborn animals were not pos-

sible until a way was developed to induce the animals to reproduce in captivity in large numbers. Over the 83 years that the opossum has been studied scientifically, no one has been able to breed the opossum in the usual cages inside a laboratory. Successful breeding was possible only when small numbers of animals were

allowed to roam freely in large rooms or outdoor wooded enclosures. Dr. Jurgelsky, who had unsuccessfully attempted to breed the animals in the laboratory over a three-year period during the course of his medical training at Duke University, soon found after coming to the Institute that the outdoor enclosures were not the answer.

His first attempt at breeding the animals in a small wooded enclosure during the winter of 1968 was also a failure—only a single litter consisting of two animals was born and most of the adult animals died from disease which could not be controlled under outdoor conditions. The following winter the pen size was increased to one acre, but again disease control proved impossible; in addition, Dr. Jurgelsky found that the time required to locate 60 females every day to check their pouches for young was overwhelming.

In a final attempt to salvage the colony in the spring of 1969, the persistent medical scientist housed the surviving animals in small cages constructed of wire mesh. The cages were placed in a wooded area in the hope that the animals, though caged, would respond to the natural surroundings. Under these conditions reproduction was surprisingly high. This approach appeared promising to the point that in the winter of 1969 concepts developed by Dr. Jurgelsky were incorporated, with the aid of the engineers of the Research Services Branch and

the veterinarians of the Animal Science and Technology Branch, into the design of two new buildings, built especially for keeping opossums.

The buildings are essentially frame structures covered with screen wire and roofed in part with translucent material to permit maximum natural lighting. In the unique facility, 250 animals can be housed under sanitary conditions in individual cages featuring a flip top nest box and a walk through shelf. During the breeding season, from January to June, romance is encouraged by removing partitions between males and females. A technique similar to a "pap" smear is used to indicate when females may be receptive to courtship. The timing is critical, Dr. Jurgelsky pointed out, since a female not interested in motherhood will frequently kill the male in short order.

Last year the opossums at the Institute, maintained under the clean semi-outdoor conditions made possible by the new building and mated in a controlled fashion, produced approximately 70 litters of young—probably a world's record for opossums in captivity. Encouraged by this success, Dr. Jurgelsky and his colleagues are now attempting to develop a domestic strain of the animal.

Although it has taken 80 million years, Brer 'possum has finally been brought down from the persimmon tree and onto the laboratory bench.

State Lab Performs Vital Diagnostic Service

By
Mrs. Norma B. Carroll
Chief
Virology Section

Activities of a virology laboratory fluctuate with the demand for diagnostic services, which varies with the season. The Virus Laboratory of the N. C. State Board of Health has a flexible testing schedule to coincide with the natural and seasonal variations. During the summer, viral infections of the intestines occur more frequently. Respiratory infections are more prevalent in the fall and spring. A hard freeze heralds the end of the annual season for arbovirus infections (those carried by insects such as mosquitoes).

Viral infections can become epidemic. Epidemiological (virus watch) programs for monitoring and surveillance may be employed. Two epidemics of respiratory infections were investigated dur-

ing 1970; one being the publicized "Hong Kong Flu" during February and March, and an unexpected outbreak of "Influenza B" occurring in isolated geographical areas in the state during March. The Laboratory confirmed these cases with the isolation of viruses from throat swabs and/or by demonstrating, in the patient's serum, a diagnostic rise in antibodies to the specific virus.

Diagnostic laboratory tests for the isolation and identification of a large number of specific viruses are offered routinely. A variety of blood tests are available to determine the existence of a present or past infection.

Both meningitis (inflammation of the membrane covering the spinal cord and the brain) and encephalitis (inflammation of the brain) are often the result of viral infection. One group causes "sleeping sickness," a disease of the central nervous system. This group of viruses is transmitted by biting insects. Blood tests are beneficial in the diagnosis of the infection. Since it is the brain and spinal cord which are infected, material for the isolation and identification of a specific virus is available only from autopsy. Two isolations of eastern encephalitis were made during 1970; one from a horse and one from a pheasant.

Among the various services available for the study of viruses affecting the central nervous system, is the laboratory diagnosis of rabies. The diagnosis of a rabid horse from Northampton County



Material from an individual suspected of having influenza has been previously inoculated into an eleven-day-old chick embryo. The eggs were then incubated for 48 hours more. Mrs. Judy McCormick, laboratory technician in the Virology Section of the State Board of Health, is harvesting the embryonic fluid from which she will determine whether or not influenza viruses are present and, if so, which type.

in October, 1970, the first demonstrated from this area in 15 years, confirms the absolute necessity for this service. Two cases of bat rabies complete the specimens found to be positive during 1970. The Laboratory is legally responsible for providing this service to any interested person.

Viral infections associated with exanthem (rash or fever blisters) can produce serious illnesses of the central nervous system. Two studies of Herpes simplex (a virus commonly associated with exanthem) highlighted last year's activities. One was to correlate re-

cent or past infection (as demonstrated by antibody titers) and clinically evident brain damage in a series of cases. Another was to identify the type of Herpes found in a series of clinical cases.

The purpose of the Laboratory's rubella program is to evaluate the status of immunity of persons tested and to aid in the diagnosis of the disease or syndrom (malformations of the fetus, stillbirths or abortions resulting from the mother's having had German measles in the first three months of pregnancy). Semi-

mechanized equipment (see photo) has been acquired recently to provide for testing a greater number of specimens in a shorter period of time. Workshops for training laboratory technicians in the performance of this test were held in 1969. Other workshops and bench training will be arranged as needed.

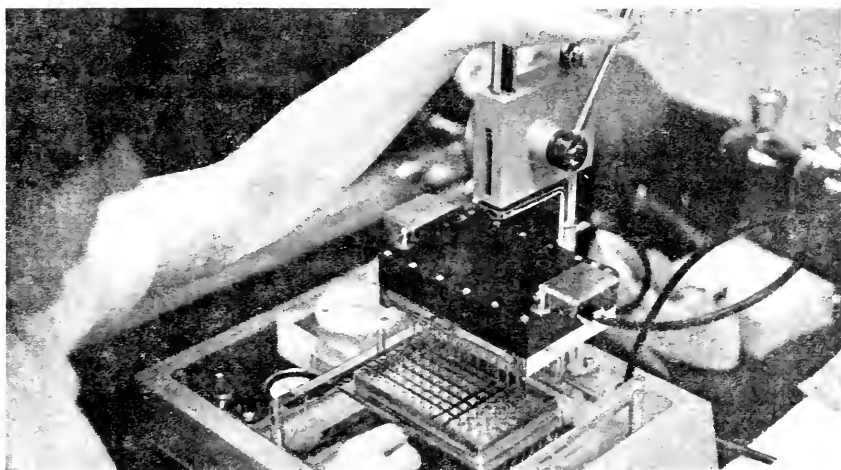
Recently developed blood tests are also available for red measles, chickenpox, viral diseases which are generally mild but are capable of resulting in extremely serious conditions such as encephalitis and deformities of the newborn. Services for Respiratory Syncytial Virus, an agent commonly associated in upper respiratory infections and for Cytomegalic Inclu-

sion Virus, associated with diseases of the eye, are available. Serology for murine typhus and Rocky Mountain spotted fever is also available.

Studies are made of intestinal virus outbreaks in general. An investigation of a specific viral outbreak of hand, foot and mouth disease is an example. Laboratory evidence, which confirmed the clinical symptoms, included viruses commonly associated with HFM and serological evidence that the patient's serum changed from negative to positive during the course of the illness.

The State laboratory is considering the need and feasibility of offering a testing program for Australia antigen for hepatitis.

The semi-automated microtiter is used to dilute blood serum specimens in order to find the highest dilution at which a positive reaction will occur. In actuality, it is a measure of antibodies (a chemical substance manufactured by the body to combat infection) in the blood stream. The technique can also aid in the diagnosis of a variety of diseases. The instrument is being operated by Mrs. Robbi Safko, laboratory technician.



Women Cancer Victims Gain Life

Trophoblastic cancer (cancer of the placenta, or "afterbirth") has gone from one of the most rapidly-fatal kinds of cancer to the one with the best chance of cure.

Although it strikes only one out of every 40,000 women after pregnancy, its mortality rate, prior to 1966, had been almost 100 per cent, with death occurring in six months. But in four years, that figure has been decreased to two per cent for some patients and only slightly higher for others.

The highly successful attack on this lethal disease has been led in this region by The Southeastern Regional Trophoblastic Disease Center, under the direction of Dr. Charles B. Hammond. The project is funded by the N. C. Regional Medical Program and Duke's Department of Obstetrics and Gynecology.

The aim of the project is to bridge the gap between known methods of diagnosing and treating the disease and the limited facilities of the practicing physician.

In the four years of the Center's existence, some 750 patients have

been screened and more than 175 have been found to have some form of malignant trophoblastic disease. Of the 175 with malignant disease, approximately half had distant spread when treatment was begun. All but six have been cured.

The trophoblast is the outer layer of the embryo, consisting of tissues formed during pregnancy to connect the embryo to the wall of the uterus. It serves to carry nutrition from the mother's body through the placenta and umbilical cord to the developing body.

If the trophoblastic tissues lose their controlled-growth pattern, they form tumors called trophoblastic neoplasms, which can be detected by an abnormal secretion of HCG (human chorionic gonadotropin), a hormone produced only in pregnancy and these diseases. If the HCG secretion does not recede within a six-to-eight week period after pregnancy is ended, the neoplasm—or tumor—is probably malignant.

This malignant form of trophoblastic cancer occurs in approximately 500 cases each year in this

country. An estimated half of these result from hydatidiform moles, grapelike masses that form in the uterus.

Term pregnancies and miscarriages account for the remaining cases.

Because efficient treatment depends on early diagnosis, a primary activity of the Center is the screening of suspects by means of a biological test ("bio-assay") to determine the amount of HCG secreted by the female at a particular time.

HCG secretion is directly related to the number of cells alive in the trophoblastic neoplasm.

Because of the complexity and expense involved, few hospitals have facilities to perform the biological assay. Accordingly, the Center provides the testing service to physicians throughout the region and also advises on treatment.

Practicing physicians from some 30 states have referred to the Center for a total of 10,000

consultations in four years.

Of all patients screened by the Center in that time period, approximately half have been treated at Duke. The other half have been treated locally.

Treatment begins with the administering of three drugs that act as "poisons" for the cancerous cells by limiting their development and reproductive capacity.

Other means of destroying the cancer are x-ray treatment and, as a last resort, surgery (the removal of the uterus).

Treatment often takes two to three months and may be a trying experience for the patient. "But I'd certainly swap two months of emotional and physical discomfort for a lifetime of good health," says Dr. Hammond.

A lifetime is what the Center—with all its supporting personnel and a background of intensive medical research — is offering many women who would have faced certain death only four years ago.



Dr. Charles B. Hammond assists laboratory technician, Mrs. Doris Terrell, in performing biological test to determine a patient's level of HCG (human chorionic gonadotropin). An abnormally high level of HCG after a pregnancy terminates may indicate the presence of trophoblastic cancer.

Vital Records and Public Health Statistics

By
Dr. J. J. Palmersheim
Chief
Public Health Statistics Section

Indians inhabited "the goodliest land" long before Sir Walter Raleigh established the first English colony in America on Roanoke Island in 1585. There Virginia Dare was the first-born of English parentage in the New World. Much less is known of the fate of this "Lost Colony." Even less is known about the vital events in the lives of the Indians of Early America. It would be over 300 years before modern man began to keep records of the basic vital events occurring among the people of North Carolina.

In 1913, the Bureau of Vital Statistics was established by the Legislature as a division of the State Board of Health to provide uniform, central registration of all births and deaths in North Carolina. Earlier legislative efforts

date back to 1881 for the collection of vital statistics at the annual tax listing and to 1778 for the recording of marriages.

In 1962, uniform, central registration of all marriages was adopted in North Carolina. Today, records are maintained on all births, deaths, fetal deaths, marriages and divorces and annulments. These are legal documents and are commonly referred to as the vital records, those pertaining to the beginning and ending of life and to the formation and dissolution of families. In the interest of public health, official recognition and treatment of other vital events in the life-span between birth and death has taken place over the years.

The original Bureau of Vital Statistics has evolved into what is now called the Office of Vital Statistics or the Public Health Statistics Section of the N. C. State Board of Health (PHSS). The department actually functions as an omnibus technical service agency to all public health professions. The expanded list of vital events recorded includes abortions, cancer cases, home health visits, diagnostic screening and a variety of other phenomena related to public health assessment, program evaluation and research. The emphasis in the expanded role of PHSS is not so much in creating or keeping a legal document for these "new" vital events as it is upon creating valid statistics for public health program planning and evaluation.

State Of North Carolina Vital Statistics Summary

	November 1970	Year to Date 1970
Births	8,416	89,801
Deaths	3,854	40,842
Infant Deaths (under 1 year)	210	2,167
Fetal Deaths (stillbirths)	142	1,503
Marriages	3,681	43,707
Divorces and Annulments	1,199	12,618
Deaths from Selected Causes		
Diseases of the heart (all forms)	1,380	14,586
Cancer (total)	540	6,012
Cancer of trachea, bronchus and lung	115	1,158
Cerebrovascular disease (includes stroke)	439	4,886
Accidents	340	3,023
Motor vehicle	178	1,550
All other	162	1,473
Diseases of early infancy	119	1,278
Influenza and pneumonia	119	1,528
Bronchitis, emphysema and asthma	54	635
Arteriosclerosis (hardening of arteries)	47	555
Hypertension (high blood pressure)	15	225
Diabetes	82	755
Suicide	39	487
Homicide	45	565
Cirrhosis of liver	53	575
Tuberculosis, all forms	6	121
Nephritis and nephrosis (certain kidney diseases)	29	228
Infections of kidney	26	261
Enteritis and other diarrheal diseases (stomach and bowel inflammations)	11	94
Ulcer of stomach and duodenum	17	129
Complications of pregnancy and childbirth	28
Congenital malformations	32	420
Infectious hepatitis	2	10
All other causes	459	4,441

Marriages, divorces and annulments are by place of occurrence, all other data are by place of residence.



*"Do be careful, Doctor. It's been in
the family for years."*

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On the Cover

The patient being put to sleep is understandably apprehensive because he, or she, knows that most surgery is serious and, certainly, one of life's major events. Much of the fear of the unknown can be eased and a smooth induction anticipated if the anesthesiologist has established adequate communications by exhibiting a competent and reassuring manner. Many surgical procedures, impractical a few years ago, are now commonplace mainly because of advances in anesthesiology. Contributions of the anesthesiologist are considered vital to an uneventful and complete recovery of the patient.

COMMENT

... the learning goes on



By
Dr. Corrina Sutton
Training Officer
State Board of Health

Dr. Sutton

When an individual becomes an employee of the N. C. State Board of Health or a Local Health Department, he can expect his learning experiences to continue during the course of his employment.

Appropriate training and education opportunities are made available to all employees, from health service aides to medical administrators.

These fringe benefits enable employees to more effectively serve the general health needs of the people of the State. The staff is able to keep abreast of new procedures and techniques in public health practice. They are better qualified to take the initiative in effecting changes and in implementing new health programs and developments in the State.

In addition, through the development of employee potential, State and County Health Departments are able to raise the quality of health services, reduce the number of vacant positions and to retain competent specialists.

In order to insure maximum results, the State Board of Health is undertaking a review of the educational and training needs of employees as they relate to health goals and objectives projected by State and Local Governments. Through utilization of the "systems approach" the State Board of Health Advisory Committee on Education and Training is developing a comprehensive plan of staff development that will encompass learning experiences for personnel in all categories of employment.

Implementation of the education and training plan will require cooperation and support of State and Local Health Agencies, educational and training institutions and the State Department of Administration and Personnel.

... You're Going to Have a Good Sleep *(still the patient worries)*

There is a growing crisis in North Carolina and throughout the nation in the medical specialty of anesthesiology.

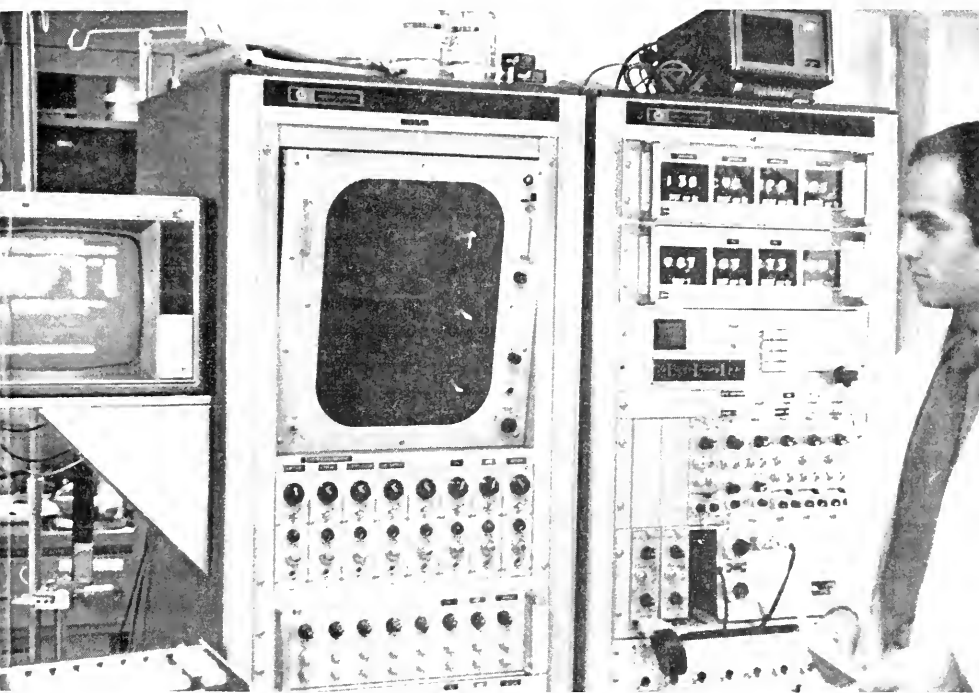
Specialists say that good medical practice requires a ratio of one anesthesiologist per 15,000 population in order to provide adequate patient-care. Only seven states can boast of this ratio. North Carolina ranks third from the bottom among all states, with a ratio of one anesthesiologist per 71,000 population. There are about 70 anesthesiologists in North Carolina (including residents) and approximately 500 Certified Registered Nurse Anesthetists.

In 1969, 30 million surgical procedures were performed in hospitals throughout the United States. The anesthetics were administered by 21,000 persons in the profession—10,000 M.D. anesthesiologists, 1,000 M.D.'s without formal training in anesthesiology, and 10,000 nurse anesthetists (largely unsupervised by anesthesiologists). According to Dr. Kenneth Sugioka, head of the

Department of Anesthesiology at Memorial Hospital and Professor of anesthesiology at the UNC School of Medicine in Chapel Hill, the shortage is growing worse by the day.

Responsibilities and activities of the anesthesiologist in medicine today are no longer easy to describe in simple terms. In the operating room, the anesthesiologist is professionally the partner of the surgeon, with equal if not greater responsibility for the patient's life. The specialty requires the perfection of anesthetic techniques and extensive knowledge of the cardiovascular system and the effects of drugs on its functions—not only anesthetic drugs, but those used to treat arrhythmias (irregular heart beat) and heart failure.

The primary task of the anesthesiologist is to relieve pain caused by surgical procedures. Supported by a conglomerate of exotic gadgetry, he takes a patient literally to the brink of death and returns him back to normal when the operation is completed.



The acute care unit at Duke Medical Center features an independent assemblage of equipment for monitoring the vital signs of each patient who has undergone open-heart or other complicated surgery. Dr. Kenneth Hall (middle), anesthesiologist, supervises the unit. A resident anesthesiologist, along with a nurse for each patient, is on duty around the clock. The center often performs as many as 10 open-heart procedures in one week.

The anesthetizing procedure might involve cooling a patient to the point where respiration ceases, the heart stops, brain waves are flat, and there is no apparent metabolism—then, a few minutes later, awaken him—an apparently unchanged individual.

"Obviously such complicated procedures should be performed by a person whose training and experience qualify him as an expert in the specialty of anesthesiology," Dr. Kenneth D. Hall, president of the N. C. Society of An-

esthesiologist, said. "Anesthetics for most surgical procedures performed in North Carolina hospitals are administered by Certified Registered Nurse Anesthetists who have had two years of special training in addition to work required for an R.N. Degree. Although training for a nurse anesthetist is not as extensive as that required of an anesthesiologist—especially in the areas of physiology and pharmacology—she is, nevertheless, qualified to make judgments in

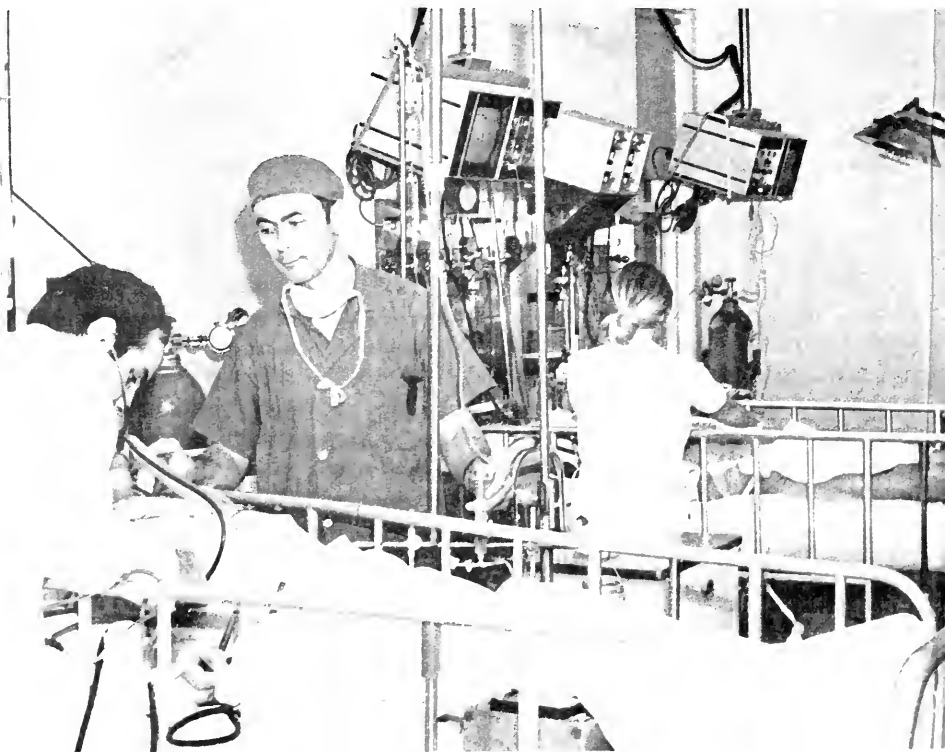
some complicated operative procedures while working under the supervision of an anesthesiologist," Dr. Hall said.

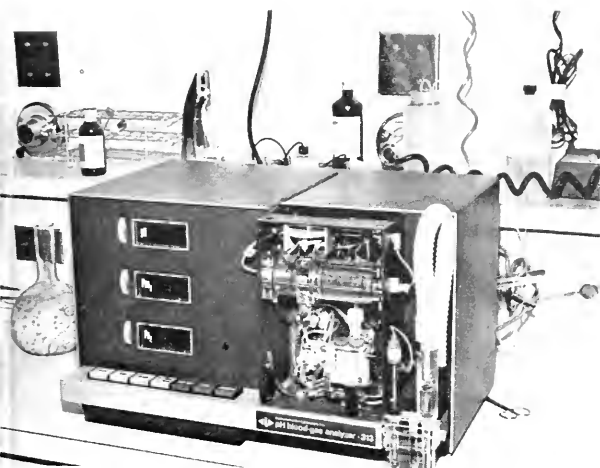
"North Carolina is a state where there are not enough anesthesiologists to go around. Dallas, Texas, for instance, has more than the entire State of North Carolina," Dr. Hall revealed. "We believe, therefore, that it is far better to maintain a high de-

gree of proficiency among nurse anesthetists, closely supervised by anesthesiologists, than to ignore the problem all together."

According to Dr. Hall, many medical students do not consider specializing in anesthesiology because, from the surface, it appears to lack glamour compared to other medical specialties—such as surgery. Another reason given by Dr. Hall has to do mostly with pro-

Patients who undergo open-heart or other complicated surgical procedures usually require a longer period of extensive care than is normally provided in a recovery room. Such patients are taken to the acute care unit at Duke Medical Center. The maze of electronic gadgetry is part of the center's central computer service. The machine calculates information fed into it concerning the patient's condition, provides an immediate read-out and then stores the information for future use. The oscilloscope (middle) displays the blood pressure and electrocardiogram of two patients at the same time. A digital read-out of blood pressure, temperature and pulse rate can be seen to the right.





One of the most exotic instruments used by anesthesiologists at Memorial Hospital in Chapel Hill is the Blood Gas Analyzer. The instrument, which has an automatic read-out, measures the amount of oxygen, carbon dioxide and acid-alkalinity in a sample of blood within three minutes—a process that formally took over an hour. The tests determine if the patient is getting enough oxygen, or whether sufficient carbon dioxide is being eliminated. Anesthetics tend to alter vital functions of the body. The acid-alkalinity balance of blood must be maintained close to normal continually because every bodily function is completely dependent upon a proper ratio. If the blood becomes too acid the heart loses its resources to keep the body in a slightly alkaline state.

professional pride. Young doctors see most of the anesthetics being administered by non-anesthesiologists and ask themselves—why train for a specialty that is comprised mostly of nurse anesthetists?

Dr. Hall pointed out that anesthesiology is not a scientific discipline in its own right, but borrows from physiology, pharmacology, biochemistry, physics, chemistry and many clinical dis-

ciplines. The anesthesiologist is afforded an opportunity to integrate all this knowledge into one functional unit and apply it directly to patient care. "It is exciting and requires a stable temperament and personality," Dr. Hall said.

The anesthesiologist must bridge between clinical medicine and the basic sciences of pharmacology and physiology. This position within the medical field is exemplified by his involvement as a physician and consultant with each patient who comes within his sphere of care.

Ideally, patient involvement begins the day before the operation with a conference between the surgeon and the anesthesiologist at which time the specific

procedure, its complexities and hazards are discussed and evaluated. The anesthesiologist then makes a careful study of the patient's medical history. He also examines the patient himself—noting any abnormalities that might influence the course of the anesthesia. The information he gains is important in his choice of correct premedication to induce a tranquil state and to control adverse reflexes. It is also valuable

in his choice of a wide variety of anesthetic agents available to him—including inhalation, local, intravenous, muscle relaxant drugs affecting the autonomic nervous system, vasopressors, cardiac drugs, electrolytes, narcotics, sedatives, and tranquilizers.

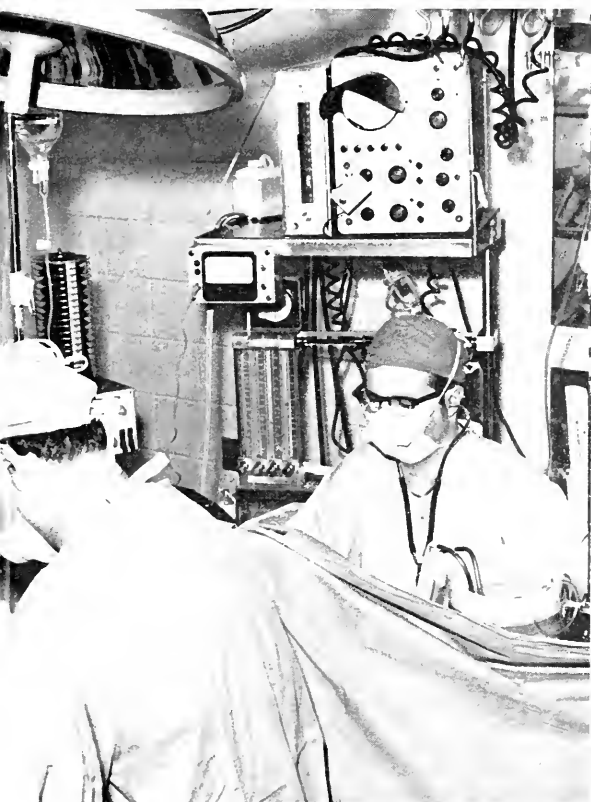
The patient is usually understandably apprehensive because he knows that most surgery is serious and, certainly, it is a major event in his life. He worries whether or not his lesion will be cancerous, whether he will be sick when he wakes up, whether there will be much pain after the operation. Most patients are primarily afraid of the unknown. For this reason the anesthesiologist will purposely make his pre-operative visit with the patient unhurried, tactful, and reassuring, for he knows by exhibiting a competent, calm attitude, by adequate communication, he can ease much of the fear of the unknown for the patient.

Dr. Hall, who is also professor of anesthesiology at the Duke University School of Medicine, explained that one of the big problems that beset the anesthesiologist in preparing the patient for anesthesia and surgery is assessing the drug therapy that the patient has been on. "This is the age of drugs," he said, "and a large part of the population is taking some sort of drugs. Some drugs, when combined, react in a manner that causes deterioration of the cardiovascular system under anesthesia. Patients who have

been taking tranquilizers of the rauwolfia family, or drugs used for treating high blood pressure, may be able to live fairly normal lives as long as they are not subjected to stress. It is entirely possible, however, for anesthesia (any kind) and surgery to trigger stress—sending the patient into shock. For this reason, patients are taken off certain drugs two to three weeks prior to surgery. When surgery cannot wait, the skill of the anesthesiologist is taxed to the limit to maintain a normal cardiovascular status during anesthesia. Technical skill alone is not enough." The anesthesiologist must be able to understand and manage some of the most critical situations in medicine.

Responsibilities of "pain doctors", as they are sometimes called, go beyond the operating and recovery rooms. Anesthesiologists see patients in clinics who have chronic pain problems. They perform therapeutic nerve blocks to relieve pain that cannot be alleviated by other measures. In many cases, careful counseling may either cure the patient of pain or at least enable him to live with it. The anesthesiologist is regarded as an authority on respiration and is constantly consulted on respiratory problems. He may also be a member of the team which treats shock and cardiac arrest in the hospital.

The N. C. Society of Anesthesiologists has only 30 members at present, but it is growing. Dr. Hall hopes that the development of a



The anesthesiologist (sitting at the patient's head) continually monitors an assortment of instruments. The round screen-like object is an oscilloscope which displays an electrocardiogram transmitted from the patient by a tiny FM transmitter. The instrument also exhibits direct arterial blood pressure. In addition, an instrument for monitoring temperature by way of a probe is inserted into the patient's throat. Tables in each of the nine operating rooms are equipped with hypothermia blankets—ready for immediate use in the event a patient's temperature drops. The gas instrument, which dispenses measured quantities of anesthetic gases, along with a respirator, are other instruments in the arsenal of equipment at the disposal of anesthesiologists at Memorial Hospital in Chapel Hill—whose inventory of anesthesia equipment is equal to that of any hospital in the nation.

full-fledged Department of Anesthesiology at Duke and continued expansion of the residency programs at UNC and Bowman Gray Schools of Medicine will give the specialty a boost and that most of the newly-trained anesthesiologists will stay in North Carolina. He pointed with pride to the post-graduate and refresher courses which will soon be implemented for doctors who administer anesthesia on a part-time basis. He also advocates that measures be taken to entice more nurses to enroll in the two-year course in anesthesia at Duke, Watts, Char-

lotte Memorial, Baptist in Winston-Salem, and Mission Memorial in Asheville.

The dedicated anesthesiologist cited three advances that have come about over the past generation which have reduced mortality in surgery and, indeed, medicine in general—antibiotics, blood-banking, and scientific anesthesiology.

Dr. Sugioka echoed the statement and cited as proof the fact that only one death has resulted from anesthesia in over 40,000 operative procedures at Memorial Hospital in Chapel Hill.

Home Health Services

By
Jane Perry
Nursing Consultant

Many people suffer illnesses or undergo surgical procedures from which recovery is not complete at the time of discharge from the hospital. In some cases, recovery is a long, slow process requiring a period of adjustment on the part of the patient. In many instances the patient could go home earlier if the services of a health professional were provided periodically in the home.

In 35 counties in North Carolina, Home Health Services (consisting primarily of nursing services) are available for patients from 30 health agencies—hospitals, health departments, voluntary non-profit organizations, etc. In addition, physical therapy services are available in 24 counties. Home Health Aid, which offers the services of non-professionals trained to assist the patient and family in carrying out the doctor's orders, is available in 23 counties and occupational therapy in two counties.

What do these services mean to the patient? The person who has suffered a stroke, for instance, can continue rehabilitation in the setting of his own home. The patient's family can be taught to

use the special equipment that might be required during convalescence. Complications can more readily be detected and treated—thus, avoiding compounding an illness.

Home Health Service might include teaching a diabetic to self-administer insulin, or reviewing the procedure taught in the hospital. A big part of the service centers around diet and the need for instructions in adapting diet requirements to that of the family. Much stress is placed upon teaching the patient, regardless of his diagnosis, to adapt to his own style of living.

Many times it is possible for a terminally-ill patient to spend his last days at home in the environment of his family while receiving the care required to prevent unnecessary discomfort and complications.

Home Health Services are not only for older people or the terminally ill. For example, it is important to the total family for a mother to be present—especially where there are young children. It is possible for Home Health Services to bridge the gap by assisting the mother in a rehabilita-



A Public Health Nurse lends a helping hand. "Sometimes, all they want is conversation . . ."

tion program—teaching her how to live with a disability so she can remain at home.

There is nothing new about providing nursing care at home. Usually, concerned organizations in the past provided nursing services on a charitable basis. Naturally, lack of financing severely hampered widespread develop-

ment of such services. Now, Medicare and Medicaid pay the cost of skilled services for qualified patients.

Home Health Agencies, however, must meet certain requirements to qualify for payment from these plans. Regulations are designed primarily to provide safeguards in order to assure that standards for quality care are established and followed. In addition, some Home Health Services are being financed in part by local health departments, United Funds and private group health insurance plans. It is possible, then, for Home Health Services to successfully skirt the high cost of hospital and nursing home care and still meet all the needs of some patients in a less expensive manner.

In order to be successful, Home Health Services must have the backing of the entire community. This especially includes health officials, physicians, hospitals, health departments, and other concerned groups. The base of operations for Home Health Services may be placed wherever the venture appears most workable in the community.

Concerned citizens should talk to community leaders and health officials to learn more about providing Home Health Services. State Board of Health consultation for establishing such services is available to any interested group. Home Health Services may some day be very important to you or someone you love.

Lack of Care Linked to Infant Deaths

By
Dr. T. D. Scurletis
Chief
Personal Health Division

Between the years of 1959 and 1963, there was a marked increase in mortality of infants between the ages of one month and one year. Since this is a period of life in which mortality is almost completely preventable, attention was centered on it.

A review of vital data revealed some interesting differentials in rates between upper and lower social economic groups, especially as related to cause of death. The lower groups had as much as a threefold increase in accidents, a tenfold increase in diarrhea and pneumonia and a strikingly similar incidence of mortality due to congenital anomalies.

A study of mortality of the age group between the years of 1963 to 1967 revealed the fact that the above mentioned increase in rate had disappeared over the five

year period and that a large portion of the decrease was directly related to a drop in a number of births occurring in the high risk population groups. A simultaneous review of children born during the perinatal mortality study indicated that mortality in the lower economic groups was markedly increased over that of the upper economic groups.

Items which have a significant bearing on mortality in this age group are:

- Infants born to unmarried women
- Infants born to women with less than a high school education
- Infants born to very young mothers—age 17 and under.
- Infants born to mothers who had a previous pregnancy in which either a fetal death occurred or a child was born alive and later died.

As a result of the foregoing reviews, a study of 700 families who had a preventable death in 1968 were compared with a matched group of 700 families who had children who survived this period. Forty-seven hypotheses were developed prior to the initiation of the study as to the potential relationships of various social factors to the outcome in pregnancy. The initial result of the study revealed the following findings:

- Those families who had a death generally had a four to fivefold increase in mortality in previous births as compared to the control group.
- The group of families which

NORTH CAROLINA STATE BOARD OF HEALTH
OFFICE OF VITAL STATISTICS
CERTIFICATE OF DEATH

REGISTRATION DISTRICT NO. _____		REGISTRAR'S CERTIFICATE NO. _____				4. DATE OF DEATH Month _____ Day _____	
NAME OF DECEASED (Type or Print)		First _____	Middle _____	Last _____			
5. SEX M <input checked="" type="checkbox"/> F <input type="checkbox"/>	6. COLOR OR RACE _____	7. MARRIED <input type="checkbox"/> NEVER MARRIED <input type="checkbox"/> WIDOWED <input type="checkbox"/> DIVORCED <input type="checkbox"/>		8. DATE OF BIRTH _____		9. AGE (10 years last birthday) _____	
10a. KIND OF BUSINESS OR INDUSTRY (During most of working life, even if retired)		11. BIRTHPLACE (State or foreign country)		12. CITIZEN OF WHAT COUNTRY _____			
13. FATHER'S NAME _____		14. MOTHER'S MAIDEN NAME _____		NAME OF HUSBAND OR WIFE _____			
15. DECEASED EVER IN U.S. ARMED FORCES? (If yes, give war or dates of service)		16. SOCIAL SECURITY NO. _____		17. INFORMANT'S NAME AND ADDRESS _____			
18. CAUSE OF DEATH—ENTER ONLY ONE CAUSE PER LINE (a), (b) and (c) Part I. DEATH CAUSED BY <i>Infant - Acidosis</i> <i>Gastroenteritis - Dehydration</i>						INTERVAL BETWEEN ONSET AND DEATH _____	
IMMEDIATE CAUSE (a) _____							
ANTECEDENT CAUSES—Conditions, if any, which gave rise to above cause (a), stating the underlying cause last. <i>Infant - Acidosis</i> <i>Gastroenteritis - Dehydration</i>							
PART II. OTHER SIGNIFICANT CONDITIONS CONTRIBUTING TO DEATH BUT NOT RELATED TO TERMINAL DISEASE CONDITION GIVEN IN PART I (b)						19. WAS AUTOPSY PERFORMED? YES <input type="checkbox"/> NO <input type="checkbox"/>	
20a. ACCIDENT SUICIDE HOMICIDE <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		20b. DESCRIBE HOW INJURY OCCURRED. (Enter nature of injury in Part I or Part II of item 18) _____					
21. TIME MONTH, DAY, YEAR HOUR OF INJURY M. _____		22a. INJURY OCCURRED WHILE AT WORK <input type="checkbox"/> NOT WHILE AT WORK <input type="checkbox"/>		22b. PLACE OF INJURY (e.g., in or about home, farm, factory, street, office bldg., etc.) _____		22c. CITY OR TOWNSHIP COUNTY STATE _____	
23. I attended the deceased from _____, 19____, to _____, 19____, and last saw her alive on _____, 19____.							
24. Death occurred at _____ on the date stated above; and to the best of my knowledge from the causes stated.							
25. SIGNATURE (Degree or title)				26. ADDRESS		27. DATE SIGNED	

had a death showed no indication of any differences in their utilization of existing medical care facilities or in their perception of the availability of medical care.

The underlying cause relating to mortality was really related to the fact that these families did not recognize severity of illness nor did they perceive the need for early intervention in an illness to prevent the tragic circumstance.

The study will be reported at a later time in depth and will analyze all of the factors studied. At this time, however, the points advanced here are significant.

This leads us to the conclusion that the mere provision of medical care resources, along with efforts to make them more available to families, will not significantly affect the problem.

The answer to the problem is one of an in-depth educational approach with a continuing care program for infants born in high risk families—that is, educating families to the importance of early recognition of signs of illness and early intervention. It is important that programs be developed that will reach families effectively and motivate them to utilize more effectively the facilities that are presently available.

A new piece of equipment is proving to be a highly useful tool in the diagnosis and treatment of anemia at Duke Medical Center.

Dr. Wendell Rosse, associate professor of medicine, explained that the new equipment "is a big help in diagnosing and treating hemolytic anemia because it provides needed information rapidly which formerly took weeks to gather."

The sophisticated apparatus is called a carbon monoxide produc-

tion analyzer. Essentially it provides a quick method of determining the rate of red blood cell destruction in anemic patients.

cells may live no longer than four days and in most patients with sickle cell anemia, red cells may survive only 10 to 15 days.

The carbon monoxide production analyzer operates on the principle that the body produces very small amounts of carbon monoxide. Each time a molecule of hemoglobin (the red pigment in the oxygen-carrying cell) is destroyed, four molecules of carbon monoxide are formed. By determining

A New Diagnostic Tool

tion analyzer. Essentially it provides a quick method of determining the rate of red blood cell destruction in anemic patients.

Usually, red cells survive 120 days, but in some instances, particularly in patients with blood disorders, these cells are destroyed more rapidly. This may represent a life threatening event—death from oxygen starvation—since red cells carry oxygen to all parts of the body.

In extreme cases of anemia, red

cells may live no longer than four days and in most patients with sickle cell anemia, red cells may survive only 10 to 15 days.

The carbon monoxide production analyzer operates on the principle that the body produces very small amounts of carbon monoxide. Each time a molecule of hemoglobin (the red pigment in the oxygen-carrying cell) is destroyed, four molecules of carbon monoxide are formed. By determining

the amount of carbon monoxide production in the body, physicians can calculate how many red cells have been broken down.

A central component of the equipment is a plastic hood with an airtight neck seal that fits over the patient's head. For two hours the patient breathes a special mixture of gases consisting of oxygen, nitrogen and a low concentration of helium.

These gases are circulated by means of a blower fan, and as the

patient breathes, the gases are circulated into a canister filled with barium hydroxide granules which remove the carbon dioxide.

The breathing gases are "air conditioned" by passing through a copper coil immersed in ice. This prevents the patient from getting too warm.

Oxygen within the system is measured by an oxygen analyzer, and oxygen is added as required to maintain a constant level. A detector system continuously monitors the amount of carbon monoxide in the system and provides that data on print-out sheets.

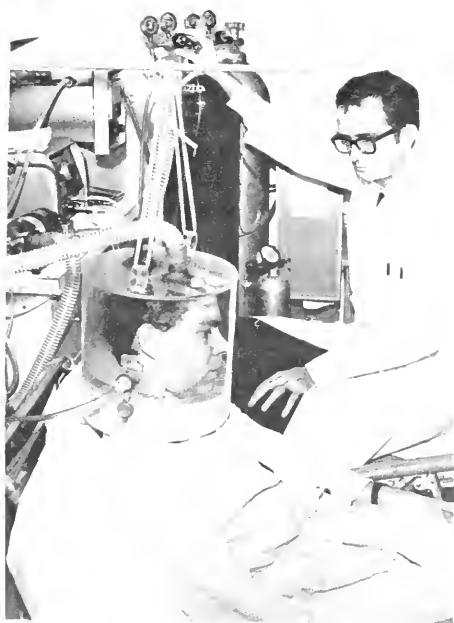
By analyzing the rate at which carbon monoxide increases in the system, Rosse can tell how many red cells are being broken down each day.

With such information available, he said, "We can quickly establish when a patient is destroying red cells too rapidly. This information is often useful in prescribing treatment."

After the destruction rate has been established by the carbon monoxide production analyzer, red cell life may be prolonged with certain types of medication. The type of treatment depends upon the nature of the illness.

Previously, red cell destruction rates were determined by techniques employing radioactive material. The technique, known as isotope labelling, required a minimum of 14 days to complete.

With isotope labelling, physicians withdrew an amount of

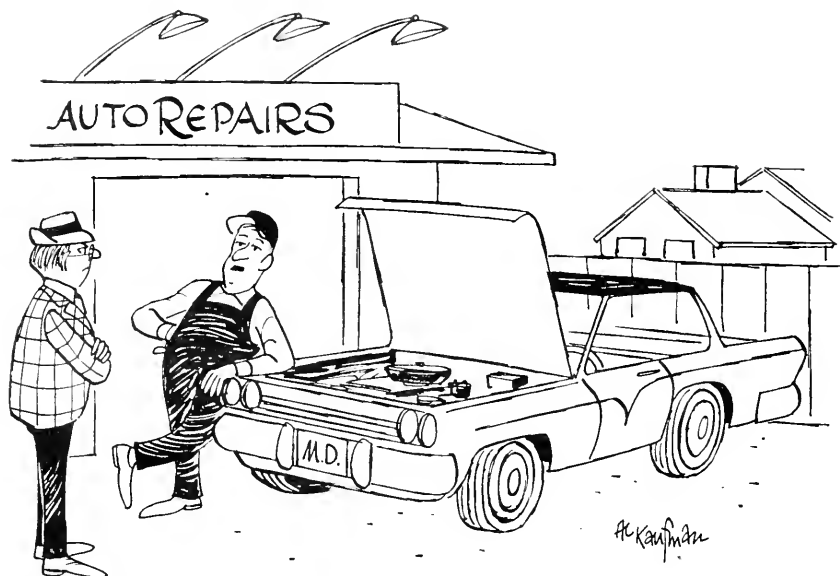


Dr. Wendell Rosse (right) demonstrates the diagnostic principles of the Carbon Monoxide Production Analyzer. The instrument provides a short cut to diagnosing and treating hemolytic anemia.

the patient's blood, combined it with a radioactive material and reinjected it. Physicians could then withdraw blood at daily intervals for two to three weeks to determine residual radioactivity.

The time required to conduct this investigation was often too lengthy to be useful in diagnosing and treating patients.

"We view development of this equipment as a useful contribution," Rosse said, "since it allows improved diagnostic and treatment methods at much less inconvenience to the patient."



"It needs a motor transplant."

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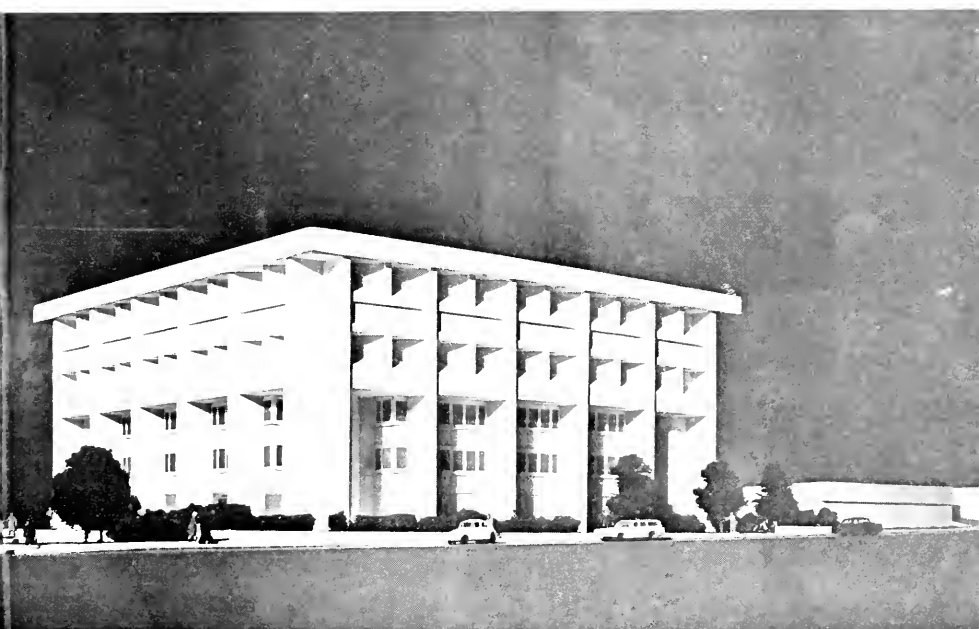
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On the Cover

Contracts were let recently for the five story State Board of Health laboratory building. The contemporary structure, which will cost nearly \$4 million, will feature a steel frame and will be clad with pre-cast concrete panels. The building will be erected on a site diagonally across from the northeast corner of the Legislative Building. The architect is Jesse M. Page Associates of Raleigh and the general contractor is the W. H. Weaver Company of Greensboro. Work is scheduled to begin in the near future.

COMMENT

new role for State Lab?



Dr. Maddry

By
Dr. Lynn G. Maddry
Director
Laboratory Division

There is at present a widely held view that basic health care is the right of every citizen and that everyone regardless of his economic status should benefit equally from advances in health sciences. The public health laboratory is playing an increasing role in making the concept a reality.

Communicable diseases that once plagued the populace are no longer prevalent. Present emphasis is placed on early detection and prevention of metabolic disorders and chronic diseases through multiphasic screening of large numbers of people.

It is now possible to screen a whole population through the multiphasic screening process. By means of a Sequential Multiple Auto Analyzer 18 different chemical tests can be made from one small vial of blood serum. Test results can indicate as many as 100 different diseases. Multiphasic screening, along with a variety of automated, computerized techniques, may some day replace much of the physician's efforts in performing routine examinations.

Although we are moving on to new methods in prevention and detection of diseases, it is still necessary to maintain competency in dealing with communicable diseases that are now and always will be with us. We cannot, for instance, eliminate our competency in detecting the diphtheria virus because we have only five or six cases a year compared to 50 cases 25 years ago.

It is expensive to maintain proficiency in communicable diseases while directing our major efforts toward meeting demands heaped on a modern laboratory. But no disease is ever eradicated.

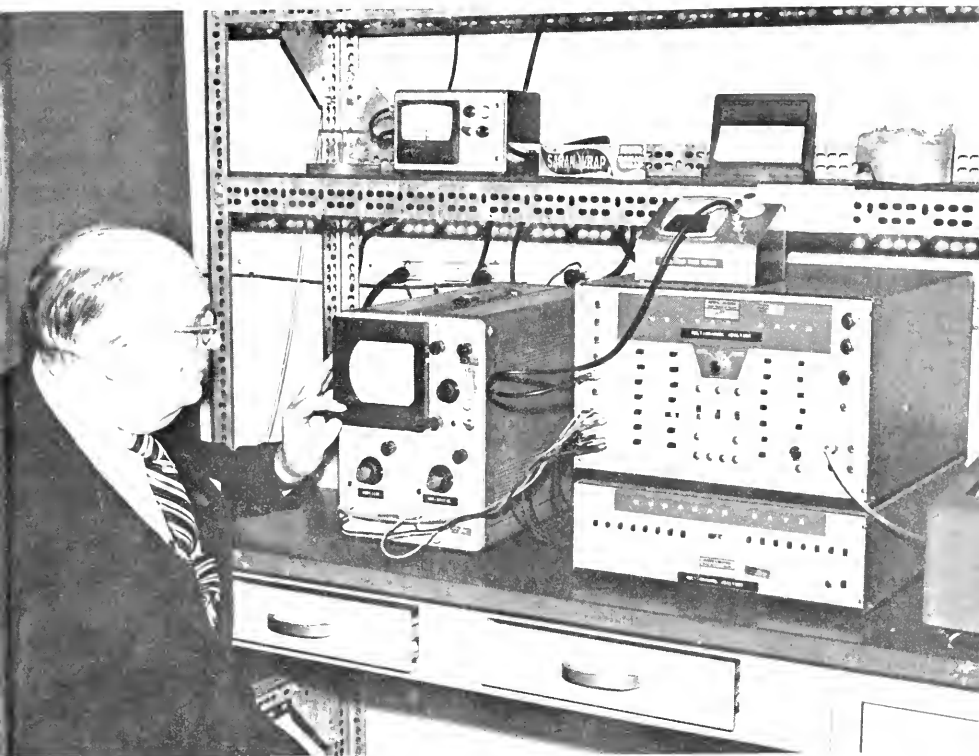
State Lab Has Notable Record of Service

THE State Laboratory is a division of the N. C. State Board of Health and has been in operation for 62 years.

In the beginning the facility was primarily charged with diagnosing communicable diseases and assuring the safety of drinking water. Activities have expanded over the years to include laboratory procedures required in the health agency's mass screening programs—a technique used in the detection of diseases in the early stages.

The state laboratory has a staff of 120 which includes microbiologists, chemists, laboratory technicians, aides, clerical and maintenance personnel. It has an operating budget in excess of \$1 million per year, and performs over one million examinations each year.

The greatest percentage of the specimens examined come from human sources. They are examined for indication of diseases such as tuberculosis, syphilis, cancer, polio, influenza, measles, malaria, and hookworm. Screening tests are performed for chronic diseases and metabolic disorders such as Phenylketonuria (PKU) which, if not corrected in infants, may lead to mental retardation. Sometimes the search is directed toward the actual cause of the disease—bacteria, viruses, parasites, fungi, etc. Other times it may lead to specific antibodies these agents cause the human body to produce. On occasions the technician may look for chemical by-products of



Dr. Lynn G. Maddry, director of the State Laboratory, N. C. State Board of Health, examines the multi-channel analyzer which counts gamma radiation in environmental samples. This machine performs the initial step in radiological analysis and helps monitor radiation levels in milk, water, food and air.

these agents—such as toxins.

Animal specimens are examined for diseases which are transmissible from animals to man—such as rabies. Bird droppings are sometimes checked for psittacosis which can be transmitted to man. The horde of birds that has taken roost at Scotland Neck during recent years can present a health problem. The State Board of

Health has undertaken a study to determine if the soil that has been fertilized by droppings presents any particular hazard to man.

The State Laboratory is also involved in the examination of environmental specimens. Public water supplies are checked periodically to determine if they are safe to drink, milk for background radiation levels and industry for

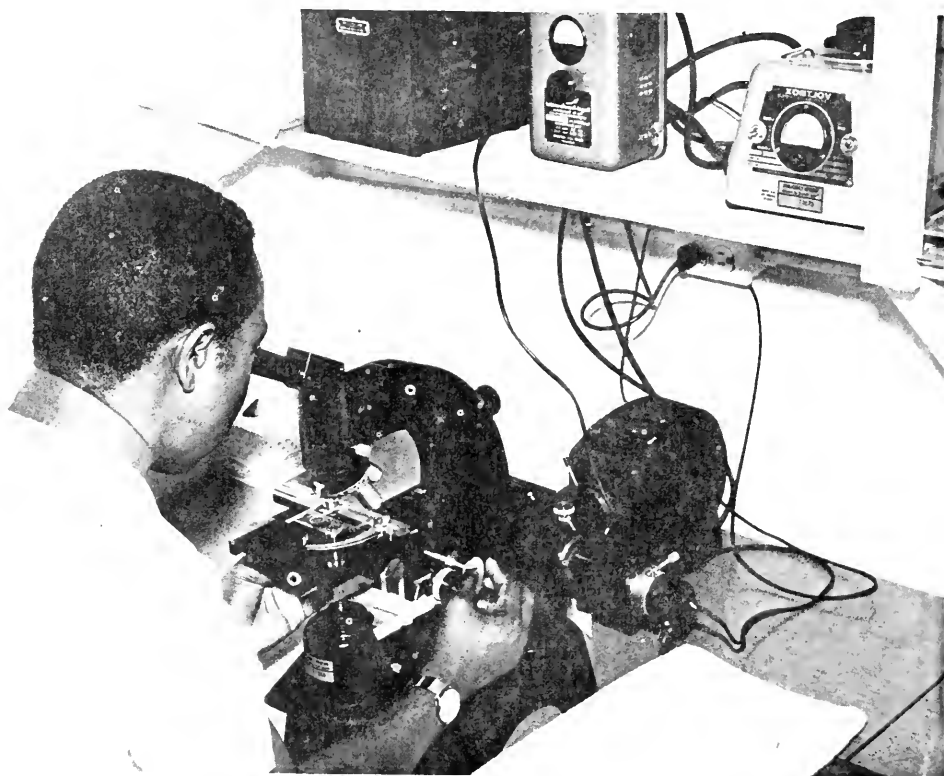
occupational hazards such as volatile chemicals, silica and asbestos dust and suspended fibers.

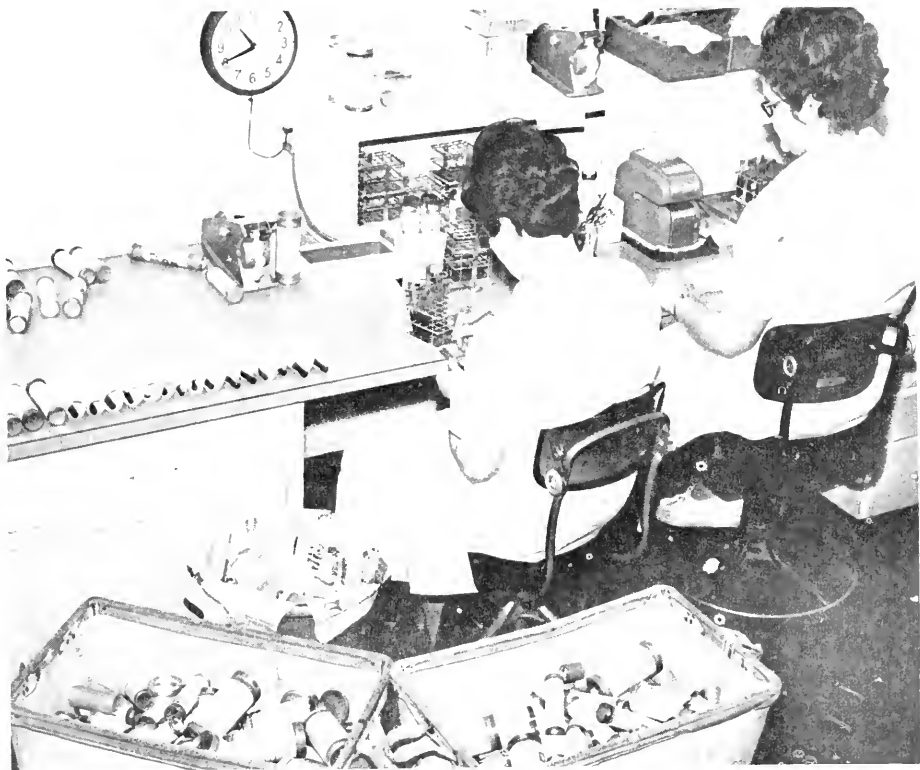
A great deal of effort is directed toward improving the level of laboratory services provided by county health departments, hospitals, and physicians' offices through reference work, laboratory certification, consultation and training.

Vaccines used in immunizations by county health departments are

distributed by the State Laboratory. Vaccines for smallpox, diphtheria, rubella, tetanus, polio, and measles are rushed to county health departments when and wherever they are needed. Antirabic treatment, diphtheria antitoxin, and coral snake antivenom can be dispatched to any part of the state on a moment's notice. Antivenom for bites of other poisonous snakes native to North Carolina is usually available locally.

This fluorescence microscope assembly is used to examine animal brain tissue for rabies. In North Carolina, rabies has been reduced during recent years due to close surveillance of the disease and a comprehensive vaccination program.





Each day the State Laboratory receives between 1,700 and 2,000 blood samples to test for syphilis. Over 400,000 samples are examined yearly. Tests are performed and the results mailed in one day.

Any citizen can submit an animal to be examined for rabies, but clinical specimens come mostly from physicians and county health departments or hospitals without laboratories which encounter difficulty identifying an organism or perhaps are unable to perform a specific test.

Most of the laboratory work is done in the building on Jones

Street in Raleigh and in a converted home on Peace Street. The laboratory operates a shellfish lab in Morehead City and a small animal farm near Cary to breed and care for mice, guinea pigs and rabbits used in various tests. Quarters are cramped, but plans are completed for a new building especially designed for the State Laboratory.

A rapidly expanding population is causing a shortage of physicians and nurses in the United States. It is vital that a supplementary health career for males be established if the problem is to be reversed.

Not only must we educate more physicians and nurses, but we must utilize their professional skills, energies, and time more efficiently. The highly trained tech-

ical method of recruiting and training the doctor's assistant and acceptance by physicians and the public. The legal status and liability of the physician's assistant and of the doctor utilizing his services must also be clearly established. The patient-consumer must be protected by legislation governing the activities of the physician's assistant and the quality of medical care delivered must

UNC Sets New Role for "Super Nurse"

By
Dr. W. Paul Biggers
Asst. Prof. of Surgery
UNC School of Medicine

nical assistant will make this increased efficiency possible. Broadened therapeutic and diagnostic techniques place additional burdens on nurses and physicians which can be borne in part by the technical assistant.

Three major obstacles must be dealt with before the various physician assistant programs will have any impact on the health care needs of the nation. There must be an efficient and econom-

ical method of recruiting and training the doctor's assistant and acceptance by physicians and the public. The legal status and liability of the physician's assistant and of the doctor utilizing his services must also be clearly established. The patient-consumer must be protected by legislation governing the activities of the physician's assistant and the quality of medical care delivered must

be assured by legislation. The needs of doctors in the various specialties of medicine are different, thus the training of the doctor's assistant for specific medical specialties, by necessity, must be varied. As related to surgery, it is our opinion that the need is for training in considerable depth in the area of surgery in which the "surgeon's assistant" is to serve. There is little to gain, at least insofar as surgeons are con-

cerned, by a broad, superficial, introductory-type medical education for the "surgeon's assistant." It is more economical and efficient if such training is narrow in scope.

The taking of a medical history and the performance of a physical examination are not areas in which the "surgeon's assistant" can be most helpful. Indeed, the taking of a medical history is a complex matter requiring a great deal of background knowledge and experience. Information gained throughout medical school and postgraduate experiences enables the physician to pursue various lines of questioning which may prove to be productive of meaningful medical information. Apparently insignificant remarks sometimes yield subtle clues. The way a patient answers a particular question may lead a skilled physician to an area of questioning that eventually sheds light on the patient's problem.

The "surgeon's assistant" should be well versed in obtaining maximum benefits for patients from various supportive agencies. He should also be acquainted with hospital admission procedures and accomplished in correlating admissions and surgery. His efforts should greatly enhance the efficient utilization of the limited number of available surgical hospital beds. In the outpatient clinic, he should assist in performing simple and complex diagnostic studies, as well as minor outpatient surgical procedures. Ideally, a specifically trained "surgeon's assistant"

would minimize non-professional chores of the surgeon and, as a result, make time available for more professional activities and patient contact.

It has become apparent that for the assistant to be of real value, he must be individually trained by the surgeon himself. An assistant trained by a nurse becomes a nurse's assistant rather than a surgeon's assistant.

In the UNC Training Program, direct patient contact is kept to a minimum, and care is taken to eliminate any possibility of the patient being misled as to professional status of the "surgeon's assistant."

We believe that the limited degree of direct patient contact and easy recognition of the surgeon's assistant, as distinguished from the surgeon or other health professions, minimizes the legal problems that have arisen regarding physician's assistants in other areas across the country. It is also important that limitations of these individuals be carefully delineated so that, at least for the immediate future, the "surgeon's assistant" will be able to function well within present statutes.

New legislation regarding the physician's assistant should not exclude the "surgeon's assistant." At UNC, a study is being conducted of the surgeon's assistant's role in a closely supervised, limited program within the Department of Surgery. The training program will be modified as experience and need dictate.

High Blood Pressure. . .

"Time has arrived for intensification of our efforts in the detection and wide-scale treatment of hypertension (high blood pressure)," says Dr. James W. Woods, professor of medicine, UNC School of Medicine. "Only in the past several years have effective hypotensive drugs which are relatively inexpensive and low in nuisance value become available. Even more recently have physicians had proof that sustained reduction of pressure can reduce conditions induced by the disease and death from hypertension and its complications.

"We are fortunate," Dr. Woods noted, "to have had several large epidemiological studies in the past decade all of which demonstrate that hypertension is common. Approximately 15 percent of the adults in the United States have pressure above 160/95. It might also be said that while atherosclerosis (hardening of the arteries) is the curse of the white man, hypertension is the curse of the black man."

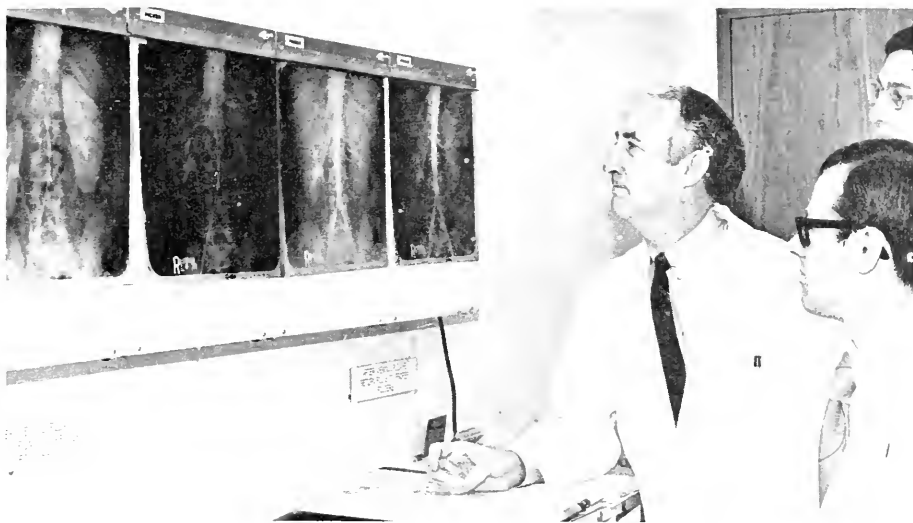
Dr. Woods explained that less than half of affected individuals are aware of the disease, and probably not more than 20 percent have adequate blood pressure control with drugs. "This is easier to understand when you consider that the average hypertensive pa-

**time to
diagnose
educate
and treat**

tient is without symptoms or complications for the first 15 years of the disease and it is only in the later stages (when fewer benefits can be expected from blood pressure control) that symptoms prompt him to see a physician.

"The problem then is to carry out wide-scale screenings of the population for sustained hypertension, referral of individuals to physicians for examination, and education of the patient as regards the necessity of long-term therapy (as in diabetes)," Dr. Woods said. "The medical examination has as its purpose both evaluation of the severity of the hypertensive process and the detection of any curable forms of that disease."

Dr. Woods pointed out that it has become apparent in the past 15 years that a sizable number of individuals have renal (kidney) artery obstructive lesions due to either atherosclerotic plaques (calcified fatty deposits) or fibro-



Dr. James Woods, professor of medicine at the UNC Medical School, examines kidney X-rays with two associates. Sometimes obstruction of the renal artery may produce high blood pressure. The condition is potentially curable by surgery.

muscular dysplasia (excess fibrous tissue attached to the artery muscle) and that surgical revascularization procedures (the removal of calcified deposits and excess fibrous tissue) may result in the cure of some. "Less common," he indicated, "are the types of secondary hypertension produced by tumor of the adrenal gland, unilateral pyelonephritis (infection of the kidney), etc. Probably all types of curable hypertension make up less than 10 percent of the total afflicted—the remainder have so called "essential" hypertension. From a public health point of view, the major task is one of initiating drug therapy."

It is apparent that because of the magnitude of the problem all types of health professionals, as

well as trained laymen, are needed for an assault on the disease. "Fortunately, measurement of blood pressure is a technique easily learned," Dr. Woods said. "Much can be learned about the extent of the process by administered questionnaires, simple chemical tests, electrocardiogram and chest x-ray. The final assessment, of course, must be done by physicians—including the choice of hypotensive agents to be used."

Dr. Woods said it is encouraging to note that there is awareness at the national level of the desirability of broad-scale efforts directed toward research and treatment of the disease. "Such effort can be rewarded by reduction in death rates from stroke, dissecting aneurysm, congestive heart and renal failure," he asserted.

The incidence of gonorrhea is rising at an alarming rate throughout the world, according to Dr. Roy Berry, chief of the Venereal Disease Control Section, State Board of Health.

Dr. Berry pointed out that the Venereal Disease Branch of the Public Health Service Center for Disease Control in Atlanta, Ga. estimates that at least two million cases of gonorrhea occurred in the United States in fiscal 1970—of which over one-half million cases were diagnosed and reported to state health departments.

More than 20,000 cases of gonorrhea were reported in North Carolina in 1970, an all-time high, compared to 18,000 cases in 1969 and 11,000 in 1965. Dr. Berry noted that there has been a steady increase of from 1,000 to 3,000 cases of gonorrhea each year in North Carolina since 1963.

Joe W. Martin, public health advisor for the State Board of Health Venereal Control Section, attributes the rising rate of gonorrhea to increased promiscuity, relaxed sexual codes (mostly among young people), greater population mobility, ignorance of the disease and insufficient funds to track down cases. "It is vital that new casefinding control methods be developed," Martin said, "because treating individual cases is the only practical means of controlling gonorrhea."

Dr. Berry explained that gonorrhea can be more of a problem in females than males due to the fact

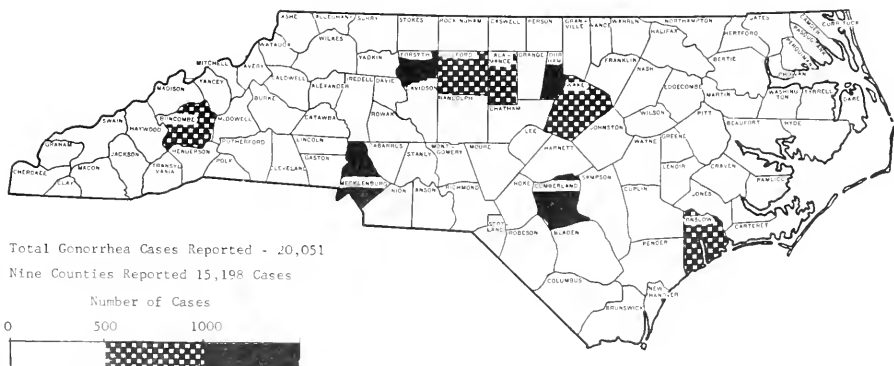
that symptoms of the disease are harder to detect in the female. He said that the ratio of reported male to female cases is almost three to one for all age groups. Among 15 to 19 year-olds, however, the ratio is about two to one. Dr. Berry speculates that this could mean young females in this age group are more knowledgeable about the risks of contracting the disease and perhaps feel freer to seek medical advice if they think they have it.

Dr. Berry is encouraged by the increased awareness on the part

VD Out Of Control?

of teenagers toward the prevalence of gonorrhea and its consequences as a health hazard. "Without a blood test or vaccine, improved control of the disease can only be achieved by cooperation of those who think that may have been infected," he said. "Volunteering for a check-up, including any necessary treatment and advice for prevention—particularly for females who have exposed themselves to possible infection and may be infecting others unknowingly—could go a long way toward curtailing the disease."

Gonorrhea Reported In N.C. During 1970



During 1970 there were more than 20,000 civilian and military cases of gonorrhea reported in North Carolina. Nine counties reported approximately 75 percent of these cases. Counties with the largest civilian population and those with the largest military population accounted for most of the cases.

Dr. Berry explained that routine venereal disease check-ups for females attending planned parenthood clinics have proven effective in casefinding and recommends the procedure when and wherever it can be implemented.

Research aimed at finding new diagnostic aids is being accelerated in the United States. Educating young people concerning venereal disease, however, appears to be the key at present to curbing its swift spread and should be given priority because lives are involved. "Certainly," Dr. Berry said,

"permanent physical and psychological damage is possible if gonorrhea is contracted and not treated promptly.

"Fortunately, effective treatment is readily available with a minimum of inconvenience. The most pressing need is for some means of influencing those who suspect they have been exposed to take advantage of the facilities we already have. To be sure, it is the logical course of action regardless of whatever advances take place in the future in detecting or treating gonorrhea."



EMERITUS AWARD RECIPIENTS . . . Four former officials of the State Board of Health received emeritus awards at a recent board meeting. They are (center to left) Dr. J. W. R. Norton, Dr. A. H. Elliot and Maurice M. Jarrett. Not present for the ceremony was Dr. C. C. Applewhite. Dr. Watson S. Rankin received the award posthumously. Others shown are (left to right) Dr. James S. Raper, president of the State Board of Health and Dr. Jacob Koomen, State Health Director.

Board Action

A key action taken at last month's meeting of the State Board of Health in Raleigh was the passage of regulations aimed at eliminating all open garbage dumps in the state and replacing them with sanitary landfills. The regulations become effective July 1.

The board also passed regulations requiring that permanent records be kept on all persons re-

ceiving above a certain level of radiation exposure. Such records are required by the Atomic Energy Commission.

Dr. T. D. Scurletis, director of the Personal Health Division, reported that legislation has been introduced which will mandate the State Board of Health to maintain the planning and coordination of the development of a total Kidney Disease Program. He also reported that the health agency is participating in a task force for the development of a total comprehensive, coordinated plan for family planning.

State Of North Carolina Vital Statistics Summary

	January 1971	January 1970
Births	8,540	8,067
Deaths	4,109	4,213
Infant Deaths (under 1 year)	211	220
Fetal Deaths (stillbirths)	144	134
Marriages	2,834	2,918
Divorces and Annulments	1,095	926
Deaths from Selected Causes		
Diseases of the heart (all forms)	1,547	1,542
Cancer (total)	551	576
Cancer of trachea, bronchus and lung	123	115
Cerebrovascular disease (includes stroke)	472	541
Accidents	289	284
Motor vehicle	140	146
All other	149	138
Diseases of early infancy	114	99
Influenza and pneumonia	147	205
Bronchitis, emphysema and asthma	65	83
Arteriosclerosis (hardening of arteries)	71	57
Hypertension (high blood pressure)	21	28
Diabetes	74	73
Suicide	49	34
Homicide	41	47
Cirrhosis of liver	47	52
Tuberculosis, all forms	8	13
Nephritis and nephrosis (certain kidney diseases)	31	23
Infections of kidney	32	26
Enteritis and other diarrheal diseases (stomach and bowel inflammations)	7	16
Ulcer of stomach and duodenum	10	10
Complications of pregnancy and childbirth	4	2
Congenital malformations	41	38
Infectious hepatitis	2	1
All other causes	486	463

Marriages, divorces and annulments are by place of occurrence, all other data are by place of residence.

A sage once wrote that one of the most ridiculous statements ever made is that one picture is worth a thousand words. "I give you," he said, "not a thousand words, but 11 words, and I ask you to put across their message in a picture: Do Unto Others As you Would Have Others Do Unto You."

Potpourri

ON AIR POLLUTION

*I shot an arrow into the air—
"it stuck."*

MAKE HASTE SLOWLY

*Rejoice at the fruit on the tree,
but wait to partake of the bounty
until it ripens.*

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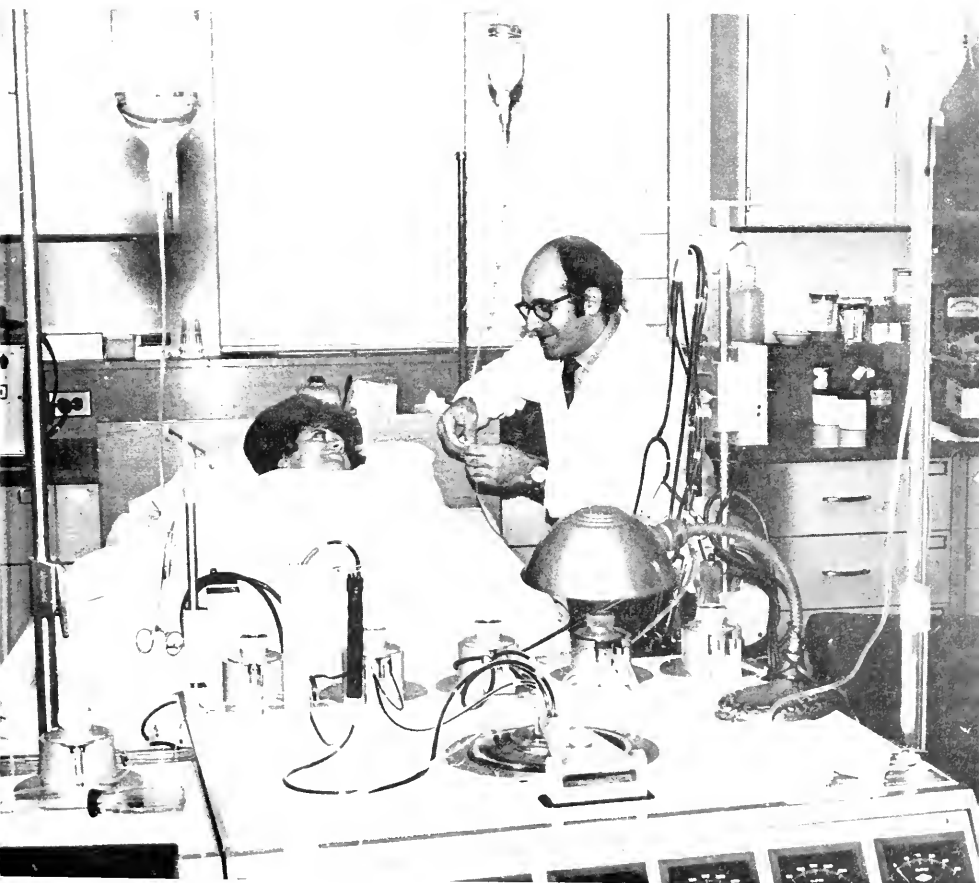
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Associate Editor

Mary W. Cunningham

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On the Cover

The Cell Separator is one of the modern pieces of equipment in blood transfusion technology. The machine is based on the same principle as a farm cream separator. It is able to separate red cells, white cells, platelets and plasma in a continuous flow. Blood is withdrawn from one arm, spun quickly and the different layers drawn off with different tubing, red cells in one tube and white cells in another. White cells and platelets are collected for transfusion and red cells are returned to the donor in the other arm.

COMMENT

X-Ray...a double-edged sword



By
Dayne Brown
Chief
Radiological Health Section

The proper use of X-ray machines is one of the most important factors influencing patient radiation exposure. In the hands of untrained people, even the most perfect X-ray machines and facilities can become a source of unnecessary radiation exposure for both patient and operator. To combat the problem, the Radiological Health Section of the State Board of Health is providing minimal training to X-ray users through special training sessions and consultation with operators during inspections. Specialists are now spending considerable time presenting lectures to regular students and attendees of extension courses at community colleges. During inspections more than half of our time may be spent training X-ray users in radiation protection. However, these are ineffective and inefficient solutions since they do not attack the source of the problem. X-ray machine operators must be properly trained before they begin making X-rays. This means then that hospitals, community colleges and other educational institutions should upgrade their programs to provide better training for future X-ray operators. This will eliminate most of the need for "after-the-fact" training activities and will permit the Radiological Health Section of the State Board of Health to concentrate more effort in the area of equipment performance and facility design. Similarly, the medical community should appreciate the importance of having properly trained operators for their X-ray equipment and should employ such personnel. Otherwise, training programs will not be effective in reducing unnecessary patient radiation exposure in North Carolina.

Cancer of the Breast



CANCER of the breast kills more American women each year than any other form of cancer, according to Dr. Isa C. Grant, chief of the Chronic Disease Section of the N. C. State Board of Health.

In 1969, 497 North Carolina women died of breast cancer, many of them needlessly. If the disease had been discovered and treated early, many could have been cured. The American Cancer Society estimates that 85 percent of women with breast cancer survive five years after treatment if

the disease is localized at the time of discovery and properly treated.

Cancer is an abnormal, unrestrained growth of cells. Unlike normal cells which grow and divide in an orderly way, creating healthy useful tissue, cancer cells are irregular and wild, Dr. Grant explained.

The body's cells sometimes form a lump, called a tumor, which can be either benign or malignant. The malignant tumor is cancer, and if untreated may spread throughout the body, destroying normal cells and eventually life. Dr. Grant said that most lumps in the breast are benign; however, only a physician can make the correct diagnosis and he should be consulted quickly if any abnormality is noted.

There is no known cause of breast cancer, but research has raised the possibility that it is caused by a virus, transmitted from mother's milk to the nursing child. "If the virus can actually be identified as the causative agent of human breast cancer," Dr. Grant said, "it would be quite possible to develop immunizations against it."

Menopausal women between 35 and 50 are more likely to develop breast cancer, but it can occur from the time the breast reaches maturity. Dr. Grant noted that breast cancer is rare in the 20's and more frequent in the 30's. However, women in their 80's have been known to have breast cancer. Statistics have shown that

breast cancer occurs more frequently in women who have never married, who did not nurse their children, and whose grandmothers, mothers, or sisters have had breast cancer.

Breast cancer is rare in men, but they are susceptible. In 1968, the latest figures available, 716 cases of cancer of the breast were reported in North Carolina. Fifteen were male victims.

Over 95 percent of all cases of breast cancer are first discovered by women themselves, some accidentally while bathing, and others during monthly self-checks. Dr. Grant urged women in the susceptible 45-55 year range to get in the habit of breast self-examination. While breast cancer is not as likely in younger women, she said that all women from childbearing age should be concerned and learn to recognize any changes in the breast which could be indicative of cancer.

The method of breast self-examination can be learned quickly from a physician or from pamphlets available in local health departments or from the American Cancer Society.

Dr. Grant pointed out that surgery is considered the most effective way of treating breast cancer. The next step may be radiation treatment if there is evidence that the cancer has spread.

Some cases of breast cancer require an operation called a radical mastectomy. This involves re-

moving the breast, the underlying muscles on the chest wall, and the lymph nodes in the armpit. "Hopefully, the cancerous cells will be removed through application of this procedure and the spread of the disease arrested," Dr. Grant said.

Dr. Grant stated that lumpectomy is a new idea in breast cancer surgery. This calls for removal of the lump only, leaving the breast intact. The lumpectomy can be done in 10 minutes while a mastectomy can take four to five hours. Dr. Grant noted that proponents of the lumpectomy claim a 70 percent cure rate, the same as the radical surgery previously described.

"It is really too soon to measure the success of this operation as opposed to mastectomy," Dr. Grant said. "Unless the cancerous tissue could be completely removed I don't think lumpectomy would cure the disease. Also, any attempt to remove just the lump when there is the possibility that other cancerous tissue is present could cause much more rapid growth of the tumor and increase the chance for metastasis."

The best safeguard a woman has against an unknown breast tumor is to regularly practice careful examination of her breasts and to have annual physical check-ups, including breast examination by her physician, Dr. Grant said. The earlier breast cancer can be diagnosed and treated, the better the chance for cure.

Man Dared To Transfuse Blood

By
Dr. Wendell F. Rosse
Asst. Prof. of Medicine
Duke University School of Medicine

Since earliest times man has wanted to exchange or transfuse blood. Only during the past few years have procedures and mechanisms been refined sufficiently to make it a safe and useful medical practice.

Appropriate reasons for which a transfusion should be given had to be recognized. Too, a way had to be found to transfuse blood that would prevent clotting. It was then necessary to develop suitable instruments, as well as knowledge of sterile techniques, so that the transfer of blood could be ef-

fected without contaminating it with bacteria.

Another major obstacle was the problem of immune reactions of recipients to blood cells from the donor. Until these problems were solved, transfusion was only a wish on the part of physicians.

According to ancient theories of medicine, blood was one of the four humors (fluids) and possessed special properties which it imparted to the individual. Courage, robustness, vigor and other similar attributes were thought to be related to blood. As a result, when

a patient was weakened, blood was given as a draught much like a tonic in the hope that the patient would acquire similar virtues. Since the method of administration did not appear curative, attempts were made to give blood by transfusion.

One of the earliest examples in which transfusion may have been attempted was in the treatment of Pope Innocent VIII, who was given the blood of three young men in 1492. Details are not clear as to whether this was as a tonic or by infusion. The treatment, however, was not successful since the Pope died shortly thereafter. Worse yet, the three young donors also died and the practice of giving blood by whatever method fell into disfavor.

The next knowledge of attempts at transfusion of blood occurred in the latter part of the 17th century, nearly 200 years later. Almost simultaneously, an Englishman named Lower and a Frenchman named Denis performed a series of experiments which showed that blood could be successfully transferred from one animal (dog to dog or sheep to sheep) to another. Further, they showed that lamb's blood could be transferred into the dog.

The system used for transferring blood was crude. It consisted of a hollow quill connected to a tube which was inserted into the artery (to force the flow of blood) of the donor. A quill on the other end of the tube was inserted into

the vein of the recipient. This type of mechanism for direct transfusion was used for many years, since no way was known to prevent the clotting of the blood when removed from the body.

Prof. Denis proceeded from animal experiments to attempts at transfusing blood in humans. Possibly remembering the fate of donors to Pope Innocent, he chose to transfuse lamb's blood into men with dementia caused by syphilis. The first three trials were not too bad, although the expected mental recovery did not occur. The fourth patient received two transfusions a few weeks apart. When completed, the patient was noted to have pain in the back, a fast pulse, dark urine, and generalized collapse—signs which point to the transfusion of incompatible blood. The man died and, shortly thereafter, transfusion was forbidden by an act of the French King and also of the English Parliament. Advances had been made but they were not sufficient enough to make transfusion safe.

During the next 150 years, much was learned about the function of blood. The ancient "humor" theory was discarded and it was recognized that the blood had to circulate, and that the quantity of blood had to be sufficient to perform this function.

A Scottish obstetrician, James Blundell, reasoned that mothers who died of hemorrhage following the birth of their child could

(Cont. next page)

be saved if the amount of blood in their body could be quickly restored by transfusion. He, again, performed studies in animals and found that if sheep blood was infused into dogs, the dogs eventually died, whereas dogs transfused with dog blood lived. Hence, he reasoned that it would be necessary to use human donors.

His method of transfer of the blood from the donor into the patient was not much different from that used by Lower and Denis except that he tried to increase the flow by the use of syringes. He treated 11 patients who would have otherwise died of hemorrhage; four of the patients survived. At least three others again suffered the mysterious symptoms of back pain, dark urine, collapse, and shock which Denis had noted. Progress had been made but transfusion could be used only in dire circumstances since incompatibility reactions, when they did occur, were severe.

During the 19th century, many improvements were made in the collection of blood. Syringes and special bottles for collection were developed. Sterile methods to prevent infections from bacterial contamination were developed. It was not until 1942 that a solution of sugar and citrate was developed which would prevent coagulation of blood. Using this solution, refrigerated blood would last up to three weeks. Thus, the problem of collection and preservation of blood was gradually solved.

Although transfusions were used considerably during the Franco-Prussian War of 1871, incompatibility reactions continued to occur, often leading to the death of the patient. The solution to this last major problem did not begin until 1898. In experiments on goats, Ehrlich found that the injection of red cells from one goat to another might bring about the production of proteins which are now called antibodies. These antibodies were able to destroy the red cells of the donor goat, both in the test tube and when more donor cells were injected.

Ehrlich's pupil, Landsteiner, examined the blood of members of his laboratory group and found similar antibodies in some which were able, in the test tube, to destroy the cells of others. These antibodies were present in the serum even though the person had not been previously transfused. From these experiments, he recorded the four main groups: A, B, AB and O. It was quickly realized that these antibodies were the cause of the deadly transfusion reactions which had occurred. Now, if it could be demonstrated in the test tube that the red cells of the donor did not react with any antibodies in the serum of the recipient, the transfusion could be termed successful.

It has been known for many years that, in addition to the red cells, blood contains white cells which fight infections and platelets which help in coagulation.



Dr. Gerald Logue, research assistant, Division of Hematology, Duke Medical Center, examines a package of red blood cells extracted by the cell separator. The cells are used in the investigation of chemicals found on the surface of the red cells. Such chemicals determine the various blood types. The procedure can be important in studying patients with rare blood types.

When these elements are lacking, the usual transfusion of whole blood does not provide them in useful numbers. Therefore, special methods of separating these elements from the red cells were devised. The platelets or white cells may then be transfused into the patient who lacks these cells and the red cells may be given

back to the donor.

The road to safe, modern blood transfusion has been a long and a hard one to travel. The fact that we can now give whole blood or any of its parts without serious immediate reactions is due to the research of countless people, but especially to the courage of those who first tried new things.

The Tick Season Is Here

By
Dr. J. N. MacCormack
Chief
Communicable Disease Control Section

Ticks are responsible for spreading a variety of diseases throughout the world. The most prominent in North Carolina is Rocky Mountain spotted fever.

As its name suggests, Rocky Mountain spotted fever was first described in Idaho and Montana in the late 1800's. Early in the 1900's Dr. Howard Ricketts, for whom the germ causing the disease was named (*Rickettsia rickettsi*), proved that ticks spread the disease.

Thought to be confined to northwestern states initially, Rocky Mountain spotted fever was eventually spotted east of the Mississippi and in Central and South America. A 1933 Health Bulletin article noted that "... many physicians have been seeing cases at intervals for as far back as 20 years ..."

At present North Carolina, Virginia, Maryland, Tennessee, and Oklahoma lead the nation in reported cases. Last year North Carolina was first in the nation in the number of cases reported with 88, compared to 68 the previous year.

In North Carolina the disease has been reported from the mountains to the sea but strikes hardest in the piedmont counties. This may be due in part to the concentration of population in the center of the state, but Virginia also noted that most cases occurred in piedmont counties.

The tick responsible for transmitting Rocky Mountain spotted fever here is the common dog tick; the lone star tick which inhabits eastern North Carolina may also be a culprit. The *rickettsia* or "germ" responsible for the disease is carried by only a small percentage of ticks and they may acquire their infection before birth from the mother tick or may become infected by feeding on an infected animal.

Some authorities believe that infected ticks must be attached for several hours before enough *rickettsii* are passed into the host to cause infection. This point is important to remember in preventing infection.

What can be done about Rocky Mountain spotted fever? Several points are worth stressing:

Obviously a person should avoid contact with ticks if possible. This can be achieved by staying out of bushy fields and woods during the tick season or, to some extent, by wearing proper clothing when venturing into these areas. Trousers legs should be tucked into the tops of socks. Avoid sitting down on logs or on the ground in these areas. Tick repellents for use on skin have not proven to be very satisfactory; however, the military has been experimenting with clothing treated with repellents with some success.

Reducing the tick population



Common Dog Tick

in recreational or residential areas by keeping brush and weeds cut back is a deterrent. Various pesticides such as chlordane and carbaryl (Sevin) applied at a rate of two pounds of actual pesticide per acre or Lindane at one-quarter to one-half pound per acre is also a satisfactory control method.

A Rocky Mountain spotted fever vaccine is available for persons frequently exposed to ticks such as forest rangers and lumberers. This vaccine should be given early in the season followed by a booster dose each year. Although it does not always com-

pletely prevent infection, the vaccine does tend to make infection less severe if it does occur.

Care should be exercised in removing ticks from dogs or other domestic animals in order to avoid contamination of the skin with potentially infectious tick secretions. Hands should be washed thoroughly with soap and water after handling ticks.

Children and others who work or play in the out-of-doors during the warm months should be inspected at least twice daily for attached ticks with special attention to the scalp. If attached ticks are discovered remove them by pulling slowly and steadily (preferably with tweezers) so that mouthparts are not left in the skin. After removal apply an antiseptic to the wound. Do not crush ticks between your fingers.

A probable victim should be on the alert for early symptoms of this disease. The illness usually starts within 3 to 12 days of a tick bite although about 20 percent of the patients do not recall contact with a tick. Fever, chills, headache, muscle aching, and sometimes an upset stomach are usually the first symptoms. A rash of variable nature almost always appears on the second to sixth day of illness. The rash usually appears first on the wrists, palms, ankles, and soles. It then spreads rapidly after a few hours and may resemble the pinkish rash of measles or rubella. It often changes character in a few days to become deep red or purple.

"Brown Lung" Presence Noted

Results of a study of prevalence of byssinosis (brown lung disease) among over 3,000 Burlington Industries textile employees were reported last month at the annual meeting of the Industrial Medical Association in Atlanta, Ga.

Byssinosis is an occupational respiratory disease in the cotton textile industry and is characterized by symptoms of chest tightness, shortness of breath and cough at the beginning of the work week. It is caused by inhalation of fine dust from pieces of leaves, stem and boll which are part of cotton as it arrives at the mill. The cotton fiber itself plays no role in causing byssinosis. Previous studies of textile plants have revealed byssinosis prevalence ranging from 20 to 27 percent in preparation areas, two to 29 percent in yarn producing areas and as high as 11 percent in weaving areas.

The study was conducted jointly by John Lumsden, chief of the Occupational Health Section of the State Board of Health and Drs. James Merchant and Kaye Kilburn of the Duke Medical Center.

One primary objective of the investigation was to examine byssinosis prevalence in mills selected to

provide a range of exposure to cotton dust. A second objective was to provide data on the relationship between fine cotton dust and byssinosis prevalence to help establish a threshold limit value (safe level) for cotton dust. Another was to study the mechanism of action of cotton dust in causing byssinosis, taking into account other important factors in respiratory disease such as cigarette smoking and aging. The survey included a standard questionnaire for respiratory symptoms, pulmonary function tests and chest X-rays. Extensive environmental sampling of fine dust was also done.

The researchers said prevalence of byssinosis in the three cotton mills studied varied from 11 to 25 percent, averaging 17.6 percent. In two plants processing blends of cotton and synthetic fibers, the average was 7.7 percent. In plants not using cotton, but which employed some former cotton workers, the prevalence was one percent.

Byssinosis prevalence was found to be uniformly high in preparation areas of the cotton plants, averaging 38 percent. Rates were lower in yarn-producing areas, exceeding 15 percent in each area.

In the two synthetic-cotton blend



Assembling a cyclone dust sampler for the purpose of determining the concentration of cotton dust in the roving department of a cotton spinning mill. The dust sampler is unique in that it is able to separate suspected byssinosis-carrying dust particles from nuisance dust.

mills, 20 percent of those in the preparation area, four percent in yarn making and six percent in weaving had symptoms of byssinosis.

Preliminary data from sampling of dust indicates a good correlation between the fine dust and byssinosis risk, the researchers reported. They concluded as follows:

- The prevalence figures obtained in the survey confirm previous reports of byssinosis prevalence in U. S. cotton textile plants
- Consistently the area of highest risk is the preparation area. However, because rates exceeding 20

percent were found in some yarn producing and weaving areas, dust sampling and medical surveillance are needed in these areas as well. Occupational Health programs in industry should, it was pointed out, include pre-employment and periodic examinations of all workers from preparation through weaving.

- Because of the magnitude of the problem found in the survey, higher priority and intensified effort should be given to developing basic procedures to remove or in-

(Cont. next page)



Through the efforts of scores of state agencies, health officials and cooperative dairymen, North Carolina has finally attained a Brucellosis-free (undulant fever) status. Dr. E. E. Saulmon (2nd from left), deputy administrator of the Agricultural Research Service of the U. S. Dept. of Agriculture, recently presented Gov. Scott a certificate in recognition of the event. Shown also are (from left) Dr. Martin Hines, State Board of Health, Dr. T. F. Zweigart, Jr., State Veterinarian, Dr. Jacob Koomen, State Health Director, and Gov. Scott.



Andrews

Officials credit John Andrews, chief of the Sanitary Engineering Division, State Board of Health, with much of the success for ridding the state of Brucellosis. Directing a corps of district sanitarians, he forthrightly carried out milk sanitation enforcement programs.

activate the cotton dust prior to manufacturing.

Knowledge that exposure to respirable dust in cotton textile mills produces symptoms and decrease in lung function helps to define problems which must be solved to achieve control or abolition of byssinosis, it was revealed. Because the respirable (fine) dust is not controlled by present filtration and airwash methods, treatment of cotton before it enters manufacturing areas appears

to be more practical. Solutions are being sought by pre-processing cotton or eliminating the causal material in growing, harvesting or ginning.

Continuing research is being directed toward identifying the agent or agents in cotton which causes byssinosis, the research team stated, and measuring its effects on the lungs in order to determine the connection between these effects and chronic disease in lungs.

State Of North Carolina Vital Statistics Summary

	February 1971	Year to Date 1971
Births	7,525	16,065
Deaths	3,650	7,759
Infant Deaths (under 1 year)	186	397
Fetal Deaths (stillbirths)	109	253
Marriages	2,976	5,810
Divorces and Annulments	970	2,065
Deaths from Selected Causes		
Diseases of the heart (all forms)	1,329	2,876
Cancer (total)	498	1,049
Cancer of trachea, bronchus and lung	101	224
Cerebrovascular disease (includes stroke)	457	929
Accidents	225	514
Motor vehicle	108	248
All other	117	266
Diseases of early infancy	90	204
Influenza and pneumonia	149	296
Bronchitis, emphysema and asthma	64	129
Arteriosclerosis (hardening of arteries)	68	139
Hypertension (high blood pressure)	26	47
Diabetes	70	144
Suicide	41	90
Homicide	62	103
Cirrhosis of liver	48	95
Tuberculosis, all forms	16	24
Nephritis and nephrosis (certain kidney diseases)	20	51
Infections of kidney	29	61
Enteritis and other diarrheal diseases (stomach and bowel inflammations)	11	18
Ulcer of stomach and duodenum	6	16
Complications of pregnancy and childbirth	2	6
Congenital malformations	44	85
Infectious hepatitis	0	2
All other causes	395	881

Marriages, divorces and annulments are by place of occurrence, all other data are by place of residence.

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KOOMEN AWARDS CERTIFICATE OF COMMENDATION . . . Dr. Jacob Koomen (left), State Health Director, presented Jimmy Moore (now deputy sheriff in Johnston County) the Public Health Service Certificate of Commendation in ceremonies April 14. A member of the Selma (N. C.) police force, Moore is credited with saving the life of a Selma man on Dec. 11, 1970, by using skills learned in a Medical Self-Help Training Course sponsored by the Public Health Service and Civil Defense Agency. Dr. Koomen commended Moore for his quick response in applying acquired skills in an emergency situation.



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Associate Editor
Mary W. Cunningham

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On the Cover

A married couple, one of whom may have a known hereditary problem on his or her side of the family, is often fearful that they will produce a child with the same type of problem. Other couples who have already produced a defective child also want to know their chances of producing another child with the same problem. Dr. Henry N. Kirkman, director of the Genetic Counseling Program at Memorial Hospital in Chapel Hill, can often supply the answer.

COMMENT

Pesticides...how many must die?



Dr. Freeman

By
Dr. John I. Freeman
Chief
Veterinary Public Health Section

Improper storage and disposal of pesticides and empty containers is a serious and unnecessary hazard, particularly to children. One death and two near fatalities occurred recently when three children accidentally drank parathion, thinking it was wine. Only prompt treatment saved two of the children. In another incident two children were made severely ill from playing in an empty metal drum which had contained an organophosphate material. How many children must die—how many must be rushed to the hospital in an unconscious state before the purchasers and users of highly toxic pesticides realize the dangers involved? Death and severe illness can and is occurring among the white and black, the rich and the poor, the educated and the uneducated. Highly toxic pesticides are not selective; they are designed to kill and kill they do whether it be children or insects. The major part of the problem is improper storage. Children are functionally illiterate in terms of reading and comprehending the message on a pesticide label. To stop the loss of young lives due to accidental ingestion of pesticides, toxic compounds must be stored under lock and key or disposed of by burying at least 18 inches deep in a remote place. Unless each individual will store agricultural pesticides in a safe place, death and severe illness will continue to occur. The question remains—how many children must die before the users of highly toxic pesticides adopt protective measures.

Health Agency Keeps Close Tabs On X-Ray Equipment



Lead-lined open cone: The proper use of a lead-lined open cone on a dental X-ray unit will reduce the radiation dose to the patient and operator. This cone eliminates most of the direct radiation to the patient's eye and thyroid regions. The reduction of scattered radiation to the patient's reproductive and blood forming organs is from 10 to 100 times less than with the pointer cone.

More and better use is being made of diagnostic X-ray today than ever before. But, while its expanded use is of unquestionable benefit, the potential for excessive radiation exposure becomes a factor to be reckoned with.

Diagnostic X-ray has been reported as constituting as much as 95 percent of the population's present exposure to "man-made" radiation.

Major factors which directly influence radiation exposure to individuals come from such sources as the quality and condition of X-ray equipment, procedures for making and developing X-rays, design of facility shielding, use of protective devices for patients and the judgment used by the doctor in prescribing X-ray.

Needless use of X-ray results in unnecessary radiation exposure. Obviously, the doctor must weigh the benefits to be derived from X-ray against radiation exposure the patient will be subjected to. When it is determined that only X-ray can provide the diagnostic information necessary to properly care for a patient, then the radiation exposure is necessary and justified.

Prime objectives of the Radiological Health Section of the



It is vital to adjust the X-ray beam size to the area of clinical interest and never larger than the X-ray film size. Improper adjustment of a variable collimator or the wrong size cone greatly increases patient and operator exposures. As indicated above the X-ray beam size should always be within the film cassette frame or less if a smaller film is used.

State Board of Health are to maximize the quality of the X-ray while minimizing the amount of radiation exposure the patient gets. To achieve this objective the department provides an X-ray inspection program. It is not only a regulatory enforcement program, but a service program for diagnostic X-ray facilities, as well.

The inspection service, which is available to all users of X-ray equipment in the state, covers all

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By making instrument checks at the operator control panel it can be determined if the lead-glass used for viewing the patient reduces the scattered X-ray beam to a very low rate.

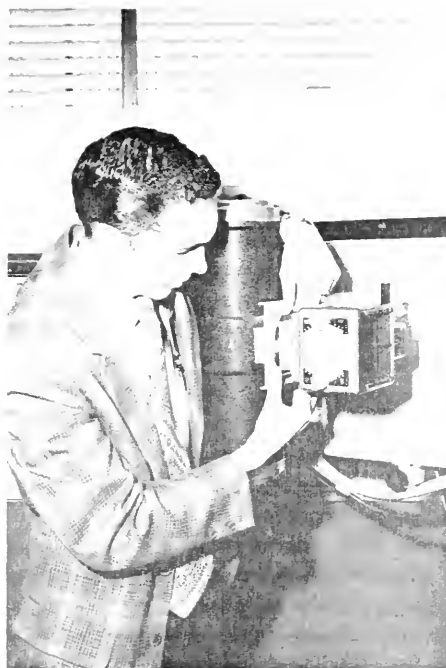
aspects of an X-ray facility as they relate to radiation exposure of a patient.

The inspector uses the most modern of radiation detection instruments in making a survey. He also observes procedures and facilities for making and developing X-rays. The inspector discusses regulation violations which must be corrected and makes other rec-

ommendations for improvement of the facility which might serve to reduce radiation exposure.

Several items which must meet regulatory requirements are:

- The X-ray machine must have a precise timer in order to properly expose the film and consistently produce high quality X-rays.
- The X-ray beam must be large enough only to expose the necessary area of the film—thus preventing the body from receiving needless exposure.
- Unwanted, weakly penetrating (soft) X-ray must be removed from the X-ray beam by placing a certain thickness of aluminum (filtration) in the beam before it leaves the machine. Proper filtration drastically reduces skin exposure.
- The X-ray tube assembly must be stable so that it will not move during the exposure in order to assure an X-ray of acceptable quality.
- The X-ray tube assembly must be sufficiently shielded to prevent leakage of radiation, except through the collimator in the direction of the film.
- The facility must have adequate structural shielding to eliminate radiation hazards outside the X-ray room.
- The facility design must afford



Filtration is one of the first items checked on all X-ray units. By becoming familiar with the different manufacturers of X-ray equipment it can be determined, in most cases, if a unit has proper filtration by visual inspection. An aluminum filter is added to absorb the low energy X-ray that would be absorbed by the patient's skin and body structure and would not reach the X-ray film.

adequate radiation shielding to protect the operator.

Other aspects of X-ray facilities which directly affect X-ray quality and patient radiation exposure, but which are not subject to regu-

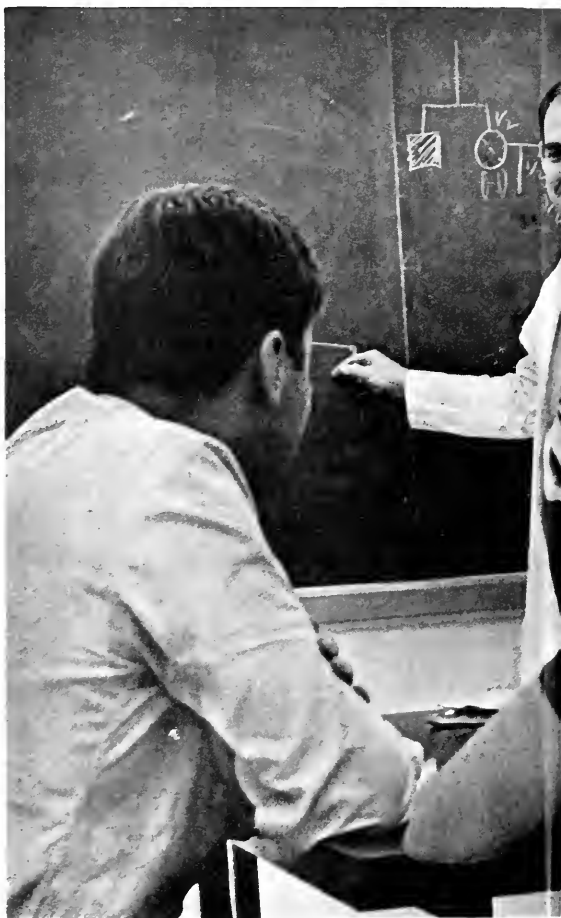
latory requirements, are set forth here:

- The darkroom should be light-tight and should have the proper "safe light" in order to prevent damage which would adversely affect X-ray quality.
- Fresh chemicals and proper temperatures should be used to ensure consistent high quality X-rays.
- Proper radiation exposure must be delivered to the film to produce a good X-ray. Both under-exposure and overexposure are undesirable since both will adversely affect quality.
- "Faster speed film" requires less radiation exposure for a good X-ray; hence, the patient's exposure is proportionately reduced.
- Advanced equipment and accessories should be used to further reduce the patient's radiation exposure. Included are (1) special "cones" which drastically reduce stray radiation exposure to other parts of the patient's body; (2) lead-lined aprons for the patient; (3) gonadal shields; and (4) special X-ray beam alignment devices.

Objectives of the doctor and the Radiological Health Section are similar. Both are seeking to ensure the best X-ray possible with the lowest exposure. The Radiological Health Section has an active program directed toward achieving these objectives.

Genetic Counseling... Unveils Secrets of Unborn

Genetic counseling is a team effort. Dr. Henry N. Kirkman, along with two members of his team of assistants, traces a family pedigree for an anxious couple. Diagnostic information and a knowledge of the family pedigree can usually supply the answers as to whether the couple will produce a defective child.



THE greatest fear of a pregnant woman is "will my baby be abnormal." For the woman who has already had one abnormal child, her anxieties are multiplied.

Within the last two years, scientific advances in genetic counsel-

Since January, 1971, the N. C. State Board of Health has provided a genetic counseling program at the University of North Carolina School of Medicine at Chapel Hill. Dr. Henry N. Kirkman, professor of pediatrics, heads up the



ing have begun to remove the cloak of secrecy from life within the womb. Now parents can be told their chances of having a healthy baby — even before conception.

program. Patients are accepted for genetic counseling only by referral from a physician.

According to Dr. Kirkman, genetic and hereditary diseases have

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been largely neglected until recently because they were considered too rare to worry about. The prevailing attitude was that nothing could be done about these diseases anyhow. Some doctors felt that if people with hereditary diseases were treated and were able to live and reproduce, the disease would continue to occur in future generations.

"There are over 1,000 hereditary problems in man. They account for five to 20 percent of admissions to children's wards of hospitals. If found early enough, some of these diseases can be treated with diets or drugs and the infant can grow up to live an almost normal life. An example of these are phenylketonuria (PKU) and galactosemia, hereditary diseases which can be treated with special diets. The idea that treating genetic illnesses will inevitably harm the overall human population is a myth. By knowing what we are dealing with and properly treating it, we may, in fact, bring down the prevalence of the disease," said Dr. Kirkman.

Genetic counseling is usually sought by a couple who already has one abnormal child, or whose family history reveals an abnormality thought to be hereditary.

The first step is usually a review of the referring physician's information and a detailed family medical history, or pedigree. Then the abnormal child may be examined, or in the case of suspected hereditary disease, the couple's affected brothers and sisters may also be examined. The geneticist may

want chromosome or enzyme studies of the blood or skin cells of the couple in order to make an accurate diagnosis.

If the woman is already pregnant, a quick and relatively painless procedure known as amniocentesis, which involves drawing about two teaspoons of the fluid surrounding the fetus from the uterus, may be suggested. The fluid contains cells shed by the fetus, and tests run on these cells may detect a chromosome error or an error in metabolism—either of which can add up to a defective child.

The counselors present the facts to the parents who must decide if they want to terminate the pregnancy or have the baby even though it may be abnormal. If the fetus is normal, the mother is spared further worry about this possibility throughout the remainder of the pregnancy. At UNC, counseling is conducted by a team of several types of specialists, including cytogeneticists, physicians, biochemists, and social workers who study the history, physical and laboratory findings to calculate the possibilities of the baby's having a birth defect.

Almost all chromosomal disorders, a common problem being mongolism, can be detected through amniocentesis. Dr. Kirkman stated, "It is now technically possible for all women who desire it to have a baby free of a chromosome defect, which usually results in mental retardation or multiple congenital malformations." Be-

cause of the slight risk of amniocentesis, however, it is usually limited to women who have a special risk for having a baby with genetic disease.

Amniocentesis is usually done between the 14th and 18th week of pregnancy, if the woman has come for counseling by then. Frequently there is a race against time. Lab tests require between two and three weeks, and the 20th week is considered marginal for a safe abortion, although in some cases it can be done through the 24th week.

Although some risk is involved in amniocentesis, Dr. Kirkman stated that it is less than one percent. "The greatest risk is that the procedure might cause miscarriage. Our clinic has had no miscarriages. The risks are explained pro and con, and the woman should not have it unless she plans to take some action on the basis of the results," Dr. Kirkman said.

Dr. Kirkman feels that the risk is justified in any woman over 37 who becomes pregnant, particularly over 40, because the rate of mongoloid births increases with the mother's age.

"The sex of the child can also be determined through amniocentesis; however, some prospective parents prefer the suspense of waiting until birth to find out. We do not recommend amniocentesis for sex determination alone," Dr. Kirkman said.

Genetic counseling is an effective beginning in the prevention of birth defects.

New Lenses Protect Eyes

Each year thousands of people receive major and minor eye injuries as a result of their eyeglasses shattering from various types of blows, according to Dr. Isa Grant, chief of the chronic disease section, N. C. State Board of Health.

"These accidents might have been prevented or the injury lessened had the victims been wearing shatter-resistant eyeglasses," said Dr. Grant.

Laminated glass, heat-tempered glass or plastic do not shatter on impact, as do the crown-glass lenses of regular eyeglasses and sunglasses. If the blow is heavy enough, the heat-tempered lenses will break like safety glass in a car, but without injuring the wearer.

Even with shatter-resistant lenses, eyeglasses can still harbor danger if the frames are made of cellulosic nitrate, an explosive material when exposed to heat, say when the wearer is smoking a cigarette or cooking. These frames are no longer made in America, but are frequently found in imported sunglasses.

Dr. Grant noted that the N. C. General Assembly recently enacted legislation prohibiting the sale of glasses frames which contain any form of highly flammable material after July 1, 1971.

Hoke...

County With

Public Health

Problems

Hoke has been described in the press as a county with a public health problem.

Noted as the poorest county in North Carolina, and one of the poorest in the nation, Hoke does indeed falter in comparative public health statistics. The county has the highest average rate of TB, venereal disease, infant mortality, intestinal parasitism and nutritional deficiency. It also has the highest rate of Army rejections and ranks at the bottom in the number of people per room per dwelling.

It would be wrong to blame the political and civic leadership for the county's public health ills. It would be wrong also to point to a disinterested citizenry. Hoke County spends \$3.32 per capita on public health, compared to a state-wide average of \$2.97. Civic leadership in the county has worked feverishly to provide minimal public health care. Largely, they have waged a losing battle.

Not unlike a number of the

state's rural counties, Hoke's problem is primarily economic. The average per capita income totals just over \$1,700, nearly \$800 less than the average for the state. All but 3,000 of the county's 16,500 residents live in rural areas. Over half of the population is non-white which contributes to low educational and skill standards, according to Dr. Harry McLean, former part-time county health official and presently medical consultant for the southeastern area of the state.

It is ironic that Fort Bragg, which came to the county's aid four months ago by attaching a fulltime medical officer and five medics to the Health Department, contributed to the county's economic plight when about half the county's land became part of the reservation in 1918. As a result the ad valorem tax take was reduced considerably.

The Army's medical assistance came in the nick of time. The county had been without a health director for two years (it has never had a full-time director). The professional staff was down to one nurse and some of the clinics had been discontinued (others were scantily manned), Special Forces Doctor Capt. Thomas Reavell allowed.

"The skeleton staff was doing a good job, but they were simply overwhelmed with work," he emphasized. Reavell said that record keeping was an area that had been almost totally neglected during the past two years. "Medics have



Mrs. Myrtle Campbell (left), Hoke County's first public health nurse, discusses current problems with Army Special Forces doctor Capt. Thomas Reavell, who is acting as temporary health officer for the county. Unlike early days, the public health facility is the primary source of health care for the majority of the county's residents.

worked a five-day week on the records since the Army's arrival," he said, "and now they are beginning to see daylight.

"We are here to do what the people can't do for themselves," Reavell explained. "We enjoy a good relationship with the county's two doctors, and we cooperate with county officials." What would happen if the Army left? "They would probably have to close a number of clinics," the Green Beret doctor opined.

The Health Department is the county's main source of medical care (there are no hospitals in the county) and has been since it was

established in 1944. Noting the rapid spread of communicable diseases due to the lack of immunizations, concerned citizens pushed for a health director and a public health nurse.

Operating out of three rooms in the basement of the County Office Building, Dr. J. W. Wilcox, who was hired on a part-time basis, and Mrs. Myrtle Campbell, the county's first public health nurse, began an immunization program, screened for tonsil defects, instructed midwives and ran blood tests among high school students for syphilis. Mrs. Campbell recalls that a num-

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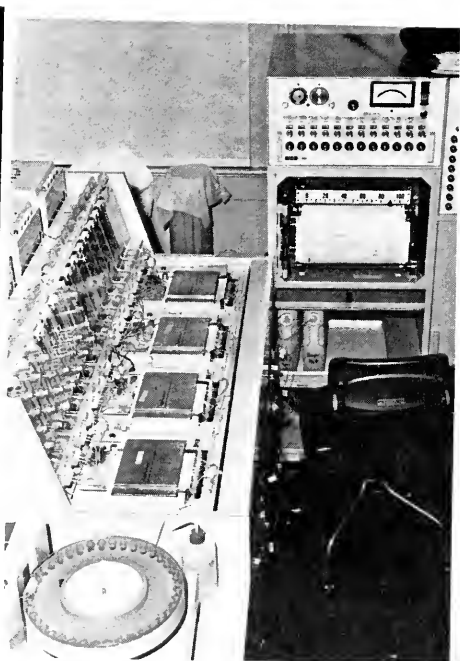
now — an expanded building

ber of cases of syphilis were turned up that had infected succeeding generations for decades. "Public health was new to the area and people had no conception of its aims. Only about 50 visited the Health Department per month compared to over 1,000 now," she said.

The present facility was built in 1956. A renovation program which will be completed in the summer will double the floor space. Most of the construction funds were borrowed from Advancement, Inc., a corporation created by Bladen, Robeson and Hoke Counties for the purpose of business development. The county put up about \$10,000.

"We are just beginning to get going," Dr. Reavell said. "With the help of a Greensboro pediatrician, Dr. M. Y. Bartling and Dr. T. C. Vinson from Laurel Hill, we provide 14 clinics on a monthly basis." The local staff includes two public health nurses and two licensed practical nurses.

The Army has turned the county's health care problem around for the time being. But farsseeing county officials look to the future with understandable anxiety—fearful of the day when the Army will pack up and leave. For they are aware of the efforts exerted in trying to hire a health director—to no avail.



A NEW BLOOD CHEMISTRY PROFILE system, capable of making determinations that can indicate as many as 100 different diseases from a single small sample of blood serum, was recently installed by the biochemistry section of the N. C. State Board of Health. Operating at the rate of 60 samples per hour, compared to 30 for the previous system, the Sequential Multiple Auto Analyzer can be programmed to perform any 12 of a variety of biochemical tests by means of unique "analytical cartridges." These "plug-in" units can be substituted for one another to provide flexibility equal to demands as screening programs of the State Board of Health change. The system is less expensive to operate because less reagent (chemicals used to react with chemicals being searched for in the serum) is required for each test. Medical practice today demands instrumentation which is not only fast and accurate, but capable of producing a wide range of clinical data.

Auto A Health Hazard: Koomen

In his annual report to a joint meeting of the N. C. Medical Society and the N. C. State Board of Health, in Pinehurst last month, Dr. Jacob Koomen, state health director, pointed to the automobile as a health hazard of critical proportions and cited it as a major cause of disability and death in North Carolina. "The automobile was, in fact, the fourth leading cause of death in the state in 1970," he said.

Dr. Koomen called attention to contributions made by the physician through North Carolina's driver medical evaluation system. He explained that the first step in the review process is an examination by a physician of a patient's choosing. There are 36 three-member physician evaluation panels in the state. The process also includes the Driver License Medical Review Board which consists of four physicians and a representative from the Department of Motor Vehicles. Of the 4,764 medical reports reviewed by the panels in 1970, nearly three-fourths were new cases. Of the total 789 were denied driving privileges.

Dr. Koomen emphasized that the issuance of a driver's license is based on the principle that operation of a motor vehicle is



Dr. Koomen

a privilege granted by the state to those who demonstrate skill through a testing procedure.

"Law enforcement is an important measure in the control of the drinking driver who consistently breaks traffic laws," the public health official said.

At an earlier meeting of the State Board of Health additional rules and regulations were approved governing the operation of the medical examiner system. Regulations granting the health agency authority to perform breath alcohol tests was amended. The amendments will become effective August 1, 1971. Favorable action was also given to vaccine preparation and dosage requirements called for in a revised childhood immunization law recently enacted by the General Assembly. Copies of regulations and amendments may be secured from the N. C. State Board of Health, Raleigh.



"What if I am a hypochondriac? You must admit it's the most serious case you've seen."

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On the Cover

Now that a method of preventing dental disease has been discovered and its effectiveness proven, education of the public is the next step. Sen. Hector McGeachy, co-introducer of two preventive dentistry bills in the General Assembly, is being taught plaque control technique by Dr. Henry Aldridge of Greenville. Dr. Aldridge is a member of the N. C. Dental Society's Plaque Control Committee. The Dental Society, UNC School of Dentistry, and N. C. State Board of Health are cooperating in an effort to lessen North Carolina's dental problems through teaching prevention.

COMMENT



Dr. MacCormack

Measles Out Of Control

By
Dr. J. N. MacCormack
Chief
Communicable Disease Section

Dr. Samuel Darling, a malaria expert of some years ago, was supposed to have said, "If you wish to control mosquitoes, you must learn to think like a mosquito." Since measles is not spread by mosquitoes but by human "vectors," Dr. Darling's statement might be rephrased a bit: if you wish to control measles, you must learn to think like a person with measles. Since the person with measles is usually a child, perhaps we ought to be principally concerned with learning how the person responsible for the child's care thinks—his parent.

Parents who do not insure that their children receive preventive immunization against communicable diseases for which vaccines are available are at times callously characterized by Public Health workers as "apathetic" or simply "uninformed." Perhaps in truth that portion of the general public which does not avail itself of measles vaccine is not uninformed in the broad sense because they do have a body of knowledge about measles. Most parents had measles when they themselves were children and thus "know" that it is a common childhood disease which everyone has and gets over. Unfortunately, most do not know that measles can be a killer orcrippler for life and is thus worth preventing.

Measles is now out of control. If we are to bring it under control we must replace misinformation with information about why children should be protected against an unnecessary disease. More than that, we must also make immunization against this and other immunofacient diseases accessible to those who need them.

Nurses To Test For Cancer

Each year, over 1,000 cases of uterine cancer are reported in North Carolina. Last year, 308 women died of the disease in the state.

If uterine cancer is detected early enough, it can be completely cured, according to Dr. Isa Grant, chief of the chronic disease section, N. C. State Board of Health.

In an effort to make detection services available to more women throughout the state, the Durham County Health Department and the N. C. State Board of Health recently sponsored a training program to teach nurses to take a Pap smear. Usually done by a physician, the Pap smear is a quick and painless test used to identify early evidence of uterine cancer before it spreads.

The Pap test is named for Dr. George N. Papanicolaou, who in the 1940's perfected the method of discovering uterine cancer from vaginal secretions, rather than from a tissue sample. Cancer cells are shed by living tissues as readily as normal cells. Papanicolaou learned that by scraping the mouth of the cervix (the outer end of the uterus) he could gather cells which the body had cast off and examine them microscopically. The structure of the cells indicates whether cancer is present

before there is any visual clinical evidence of the disease.

Since the discovery of the Pap smear early detection method, the mortality rate from uterine cancer has dropped 50 percent, according to Earl Emory, chief of the State Board of Health cancer cytology section.

Learning to gather the cells or taking a Pap smear is a relatively simple procedure. Thirty-six public health nurses from across the state participated in the three one-week training sessions, with a group of 12 in each session. "With their training," Dr. Grant said, "it will now be possible for the nurses to initiate a cancer control program in local health departments.

"Women over age 18 should have a Pap test at least once a year. By repeated examination, it is possible to detect uterine cancer in time to achieve a complete cure," Dr. Grant said. "However, women often neglect to have a Pap test because of expense or because they are uninformed.

"Now that these 36 nurses know how to take Pap smears, the service can be offered free to a greater number of women through local health departments," Dr. Grant said. "Having a nurse take a Pap smear does not replace a thorough



pelvic exam, but it does relieve the doctor of a time-consuming procedure that can be done just as well by a nurse or someone else trained to do it."

Among the public health nurses taking the course were Mrs. Elizabeth Best with the Hertford County Health Department, and Mrs. Martha Powers, Lincoln County Health Department. Both felt that nurses if properly trained were capable of accepting the added responsibility of doing Pap smears.

"Having nurses take Pap smears should be an asset to the physician," Mrs. Best said. "It should also enable the clinics to see more people in the screening program than are ordinarily seen."

Mrs. Powers anticipates being

able to reach women who cannot afford to have Pap tests and women who have gone for years not knowing they needed one.

After the Pap smear is taken, it is sent to the State Board of Health Laboratory in Raleigh for microscopic examination and classification by the cancer cytology section. Results are labeled Class I to Class V and findings are sent to the attending physician who may request a second Pap smear or biopsy (tissue sample) if the results are suspicious.

According to Emory, the Pap smear is not a final diagnosis but alerts the doctor that something is wrong. "The Pap test is one of the easiest and most accurate tests for determining the presence of early cancer on a mass screening basis," he said.

Dentists Attack Plaque

Dental disease is the most common disease known to mankind. In North Carolina, it is a statewide problem, affecting all age groups and economic levels. And it is compounded by the shortage and maldistribution of trained dental manpower.

A growing number of North Carolina dentists foresee solution through preventive dentistry.

A technique has been discovered for destroying and preventing dental disease—called plaque con-

trol. Research and experience have verified its effectiveness.

Now, the people must be told about plaque and taught to prevent it.

For the first time in North Carolina's history, three areas of professional dentistry—the N. C. Dental Society, UNC School of Dentistry, and N. C. State Board of Health Dental Division — have banded together to reach the people with the preventive dentistry message and to try to lessen the state's dental problems.

The program involves the total preventive dentistry picture, according to Dr. E. A. Pearson, Jr., director of the Dental Health Division, N. C. State Board of Health. "It includes school and community fluoridation, good diet, and periodic checkups.

"But the major emphasis is on plaque control. Plaque is the greatest offender we know. It has a dual capacity to create havoc in the oral cavity because it causes gum disorders and tooth decay," Dr. Pearson said.

What is plaque? Why does plaque control work? Dr. Charles T. Barker, New Bern dentist and dental member of the N. C. State Board of Health explains:

"Plaque is the common denominator of tooth decay and gum disease. Dental plaque is formed when bacteria (primarily streptococcus mutans) collects between and around the necks of teeth.

"Plaque forms an impermeable membrane, or coating, over the tooth. Sugar can get through the



Dr. Henry Aldridge, center, demonstrates flossing techniques to dentists attending a plaque control seminar in Chapel Hill recently. Continuing education of dentists in new methods of prevention is a major goal of the preventive dentistry program.

coating to feed the bacteria, however, which eventually grows into a bacterial colony. The colony gives off acid that eats away at the tooth and causes cavities, gum trouble and bad breath.

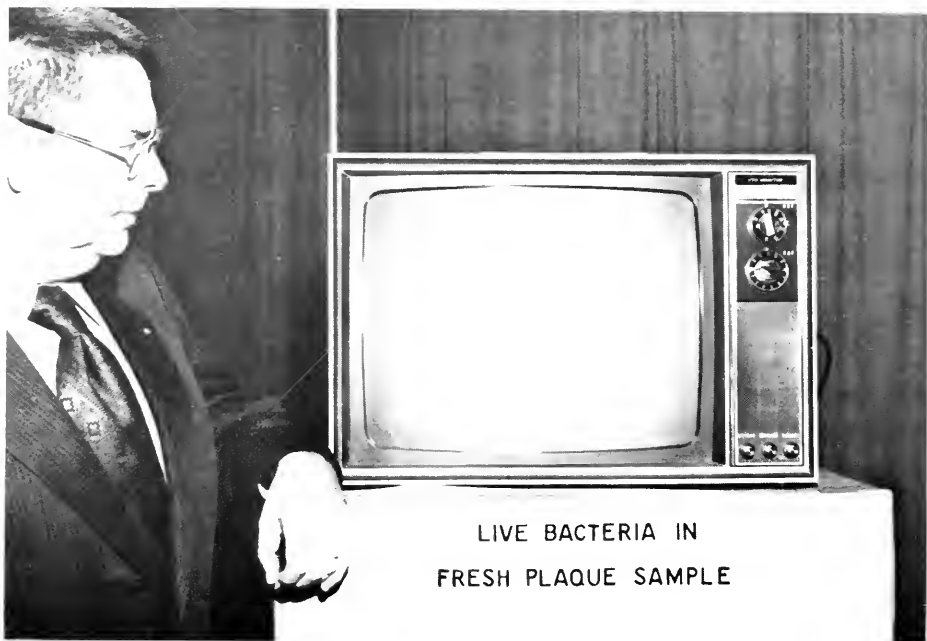
"If it is allowed to colonize for over 24 hours, the bacterial coating blocks the saliva's natural cleansing action," Dr. Barker continued.

"The presence of bacteria in the mouth is not harmful as such because saliva neutralizes its by-products. It is only harmful when allowed to colonize.

"Normal brushing prevents most plaque from organizing on

the surface areas of the teeth. However," Barker said, "96 percent of the harmful bacteria in the mouth lives between the teeth and the gingival sulcus, the tiny ditch around the tooth at the gum line. This area, impossible to reach with a normal toothbrush, is a breeding ground for plaque.

"The technique for disorganizing plaque involves flossing and brushing. Unwaxed dental floss is passed between the teeth and just below the gum line. A specially designed brush is held at a 45 degree angle and jiggled until the bristles reach under the gum into the ditch.



Dr. Barker views a live sample of bacterial plaque projected on a TV monitor by a camera attached to a phase-microscope. This was part of an exhibit at the annual N. C. Medical Society Meeting in Pinehurst.

"It takes 24-30 hours for bacteria to regroup into plaque. Studies have shown that flossing every 24 hours is nine times as effective as brushing," Dr. Barker said. "With proper flossing, dental disease will not have a chance. Everyone who practices plaque control can expect to keep his natural teeth as long as he lives."

Pioneering in discovering the plaque control method was Dr. C. C. Bass, a retired pathologist and former dean of Tulane University Medical School. As a retirement project, he chose to do research on combating dental disease be-

cause it is the most prevalent disease known to man.

In the late 1940's, he discovered that plaque could be controlled through use of unwaxed dental floss. His findings were recorded in academic journals and promptly forgotten.

In the mid-1950's, Dr. Sumter Arnim, professor of pathology at the University of Texas in Houston, began similar research. He uncovered Bass's findings and built upon them.

Dr. Arnim and Dr. Robert F. Barkley, a young dentist from Illinois, began teaching and

preaching the benefits of plaque control and preventive dentistry. By the late 1960's and early 70's, the movement was gaining momentum.

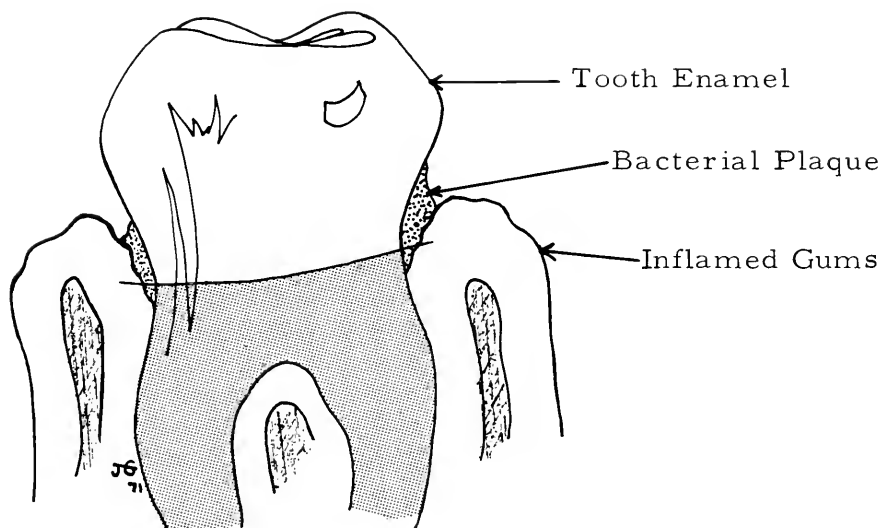
Both Drs. Barker and Pearson studied under Dr. Arnim and caught his enthusiasm for preventive dentistry. They have been instrumental in gathering support from legislators, dentists, and citizens for a comprehensive preventive dentistry program in North Carolina.

At this printing, two bills to fund the state's preventive dentistry program are before the N. C. General Assembly. If ratified, the bills will provide for the hiring of 20 dental hygienists to teach flossing in public schools, and expanding fluoridation to 40 rural schools.

North Carolina is the first state to attempt a statewide plaque control program. National dental publications have cited the state's program as one of the best.

"We know plaque control is successful on a one-to-one basis," Dr. Pearson said. "We believe we can motivate people on a mass basis."

Dr. Pearson and his assistant, Dr. George Dudney, spoke of the changing role of dentists. "The philosophy of dentistry is being refocused," Dr. Dudney said. "Dentists are tired of being tooth mechanics—as Barkley would say, working on a drill, fill and bill basis, always dealing with the effects of dental disease and not the cause. The new emphasis is on preventing dental disease and saving teeth."



Med Head Urges Cost Control

THE simple relationship of the doctor and patient has been made complex by the addition of the third party (insurance companies and government aid programs), to the point that today it has become difficult to focus attention on the basic consideration—the patient, according to Dr. Charles W. Styron, newly elected president of the Medical Society of North Carolina.

In his inaugural address to the 3,500 member organization meeting in Pinehurst, Dr. Styron said that if the third party considered only what it was designed to do in the first place, act as fiscal agent for the patient, the relationship would have remained a rela-

tively simple one.

Dr. Styron charged that medical costs have compounded the relationship. "As physicians enormous demands on our time have been commanded by the third party relationship which has, at most, an indirect bearing on the health of the patient," he said.

The medical society head allowed that the patient has benefitted from the third party involvement in various health programs. "But nobody can say that costs have not increased.

"The consumer has been heard from in consideration of a number of health care programs—but consumer activity will hardly make the price tag less. To the contrary, their activity in some instances probably adds to the cost of medical care delivery. The consumer cannot have more for less," Dr. Styron declared.

The vigorous internist urged the medical profession to exert leadership in controlling the cost of medical care. "The greatest source of rising health cost lies within the hospital wall," Dr. Styron noted. "As a profession we can be helpful in controlling these costs. Critical evaluation of the need for each hospital admission can result in greater savings for medical care than anything else in medicine today. The physician, almost alone, will have to make these decisions."

Dr. Styron cited delivery of health care, cost and medical education as top priorities in medicine today. He said his administration

intends to investigate these problems and try to do whatever possible to correct defects. Dr. Styron grouped problems in the delivery of health care into three categories—access, cost and quality. He reckoned that legislation will eventually solve some of the cost problems, but pointed up access as the most difficult to cope with. To round out the dilemma attention was directed to the shortage of



Dr. Styron

doctors. "We simply do not have enough doctors in the right places to take care of the demand," he complained.

Dr. Styron suggested that medical schools give consideration to establishing clinics in remote, as well as urban areas of the state. He said that transportation must be made available to areas where health care facilities are located. "It is highly unlikely that sparsely populated areas will ever be able to provide everything the pa-

tient wants and needs, at the time and place desired. It is not reasonable to expect sophisticated medical equipment to be placed in such areas. In that case, we must depend upon rapid transportation," he offered.

"As a result of the clamor for improvement in medical services, many methods (or systems) have been suggested and some are now pending in the national Congress and state legislatures," revealed Dr. Styron. "In most cases these plans do not take into full account services that are now available. Hasty action by lawmakers may result in the introduction of methods that are not possible—methods that do not work as well as those we now have," he ventured.

The Raleigh physician said that "private practice is not anybody else's business except that of the individuals involved. I reject any system that has as one of its objectives the destruction of the doctor-patient relationship. Doctors individually and collectively are free men, and only if they adhere to this principle will they remain free," he said.

Dr. Styron quickly acknowledged that doctors are aware of that segment of our society that are at a biologic disadvantage. "These individuals can never be expected to meet their medical, social and economic debts and will need help. I must point out that this unfortunate segment is a responsibility of society at large in which the physician will bear his share of the problem," he said.

Switch To Heroin Increasing

DRUG addicts in North Carolina are switching to heroin at an alarming rate, according to Charles Dunn, director of the State Bureau of Investigation.

Dunn reported recently that his office made more chemical analysis for heroin in 1970 than for LSD, and from a percentage standpoint, even marijuana. "This is particularly distressing," Dunn said, "because when an addict reaches for heroin he has literally reached the point of no return."

The state's top law enforcement officer said he didn't think anyone knows just how bad the heroin problem is in North Carolina. "We are finding heroin about every place we look—in all areas of the state, too," he said. Dunn allowed that at least one-third of the illegal drug cases handled by his office involved heroin.

It is generally acknowledged among law enforcement officers that trafficking in drugs is usually greater where there are large concentrations of people. They are quick to point out, however, that the drug problem is no longer confined to the ghettos (among the poor). The vicious tentacles of pushers have now reached into the suburbs, country towns and even placid rural areas. Towns adjacent to military bases appear to be particularly vulnerable. Fayetteville

(including Fort Bragg), for instance, is said to have more heroin addicts than most of the nation's larger cities.

The poppy plant is an annual herb with a thick, branching, yellow root system. The plant bears alternate, dull green, ovate, clashing leaves that are irregularly cleft and toothed. The flowers are large and showy, varying in color from light pink to purplish-pink and purple to silvery white.

Opium is obtained from poppy plants that have been cultivated in rich, well-manured soils in warm and temperate climes. Opium contains the chemical contents of a number of drugs—including morphine. Heroin is a synthetically produced by-product of opium.

The drug is collected chiefly in Turkey, Macedonia, Bulgaria, Asia Minor, Persia, Yugoslavia, India and China. Shortly after the petals fall, generally in the late afternoon or early morning while the temperature is low, transverse, vertical incisions are made into the unripe capsules. Care is observed not to cut through the inner wall of the capsule lest valuable juice be lost and the seeds injured.

The white latex exudes and soon hardens on the outer surface of the capsule into brownish masses which are scraped off the



SBI Director Charles Dunn shows a display of illegal drugs and various devices for smoking marijuana.

following day on a wooden tray. The scrapings are later transferred to earthen vessels or larger trays or dumped on the ground, where the opium is kneaded by the hands to a uniform consistency. It is then shaped into balls, cakes or rarely sticks.

An addicts's first emotional reaction to heroin is reduction of tension, easing of fears and relief from worry. Feeling "high" may be followed by a period of inactivity bordering on stupor.

Heroin is usually sold heavily "cut" with milk sugar, quinine, or other materials. Typically it is

mixed into a liquid solution and injected just under the skin, or sniffed through the nose. Addiction is possible no matter what method is used.

Heroin appears to dull the edges of reality. Troubles disappear, the addict will tell you. It makes him more sure of himself. As the addict becomes more and more used to the drug, he requires increasing doses to achieve a "high." Instead, he is forced to continue using heroin to avoid the withdrawal sickness. In other words, he now shoots heroin to feel normal.

(Continued on next page)

The drug depresses certain areas of the brain, and may reduce hunger and thirst. Because addicts do not usually feel hungry, and spend their money on heroin, they become malnourished and physically depleted—vulnerable to an assortment of diseases.

Dunn pointed out that a person hooked on heroin becomes a slave to the habit. "They are not much use to themselves or anyone else. About all he can do is find enough heroin for another fix," he lamented.

What is being done about the drug problem in North Carolina? Dunn indicated everybody is groping for an answer to the problem. "It looks as if people are looking to law enforcement to solve the problem. The addict often sells drugs to keep his habit going. To that degree he is a criminal." He stated, however, that the drug problem is more than a law enforcement problem. "It is a health problem—an educational problem and, if you have children or grandchildren, it is your problem."

Methadone (also addictive) is being used as a substitute for heroin and has enabled some users to lead fairly normal lives. Dunn declared that methadone might be the answer for some people, but not for all. "We need a variety of approaches," he said.

The intense law officer has a particular penchant for education as a tool for dealing with the drug problem among young people. "I don't think youthful users realize what they are getting into. Society

has a responsibility for providing opportunities for getting involved in community life. Educational courses should be taught in school. Young people are exposed to drugs almost from the time they can walk. They need to get from school and other legitimate sources information on which they can make proper judgments.

"In spite of what anyone tells you about drugs being a fad, or something that will go away, it is not. The drug problem is here to stay," Dunn emphasized. "We must devise effective ways to deal with it." He made it clear that the initiative lies initially with parents.

Recent Board Actions

The State Board of Health at its regular quarterly meeting in Pinehurst May 19 amended regulations granting the N. C. State Board of Health authority to perform breath alcohol tests. The amendments will become effective August 1, 1971. Vaccine preparation and dosage requirement regulations specified in a revised child immunization law recently enacted by the General Assembly were also passed. Rules and regulations were also approved governing the operation of the medical examiner system. Copies of changes may be secured by writing to the N. C. State Board of Health, Raleigh, N. C.

State Of North Carolina Vital Statistics Summary

	April 1971	Year to Date 1971
Births	7,471	31,766
Deaths	3,777	15,378
Infant Deaths (under 1 year)	171	746
Fetal Deaths (stillbirths)	120	496
Marriages	3,692	12,878
Divorces and Annulments	1,256	4,574
Deaths from Selected Causes		
Diseases of the heart (all forms)	1,358	5,667
Cancer (total)	585	2,185
Cancer of trachea, bronchus and lung	121	448
Cerebrovascular disease (includes stroke)	478	1,862
Accidents	273	1,055
Motor vehicle	152	551
All other	121	504
Diseases of early infancy	94	381
Influenza and pneumonia	91	525
Bronchitis, emphysema and asthma	55	256
Arteriosclerosis (hardening of arteries)	42	241
Hypertension (high blood pressure)	16	88
Diabetes	64	272
Suicide	55	190
Homicide	52	196
Cirrhosis of liver	61	201
Tuberculosis, all forms	7	34
Nephritis and nephrosis (certain kidney diseases)	34	105
Infections of kidney	31	107
Enteritis and other diarrheal diseases		
(stomach and bowel inflammations)	13	39
Ulcer of stomach and duodenum	5	33
Complications of pregnancy and childbirth	2	10
Congenital malformations	38	174
Infectious hepatitis	3	8
All other causes	420	1,749

Marriages, divorces and annulments are by place of occurrence, all other data are by place of residence.



"That's what I was trying to tell you before you made me get a haircut. I'm not your son."

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Clay Williams

Associate Editor

Mary W. Cunningham

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On the Cover

Gov. Scott calls attention to one of many charts used during a recent news conference to emphasize facts gathered in a nutrition survey by the State Board of Health. During his campaign for governor, Scott noted signs of poor nutrition. The extent of the problem would have been difficult to determine since North Carolina was not included in a National Nutrition Survey. Determined to explore the problem, the governor asked the State Board of Health to undertake the project. Results were unveiled last month.

COMMENT

VD Control Lags



Dr. Berry

By
Dr. Roy Berry
Chief
Venereal Disease Control Section

Progress in the control of venereal disease has been singularly unspectacular recently and grossly insufficient to keep pace with the changing tide of human affairs. Incidence has reached new highs for each of the last several years. Handicaps to control are many — no vaccine(s), no blood test for gonorrhea, the often asymptomatic nature of infection. Indiscriminate sex favors spread of venereal disease and prevention is not achieved by birth control pills. Other forms of contraception presently available are not good in preventing transmission of infection. At present, control measures are inadequate and the struggle to achieve even a balance is thwart with difficulties — there is still much stigma attached to venereal disease, many cases go unreported and health education to include venereal diseases is only partially accepted and sometimes not at all. Stepped-up casefinding and treatment of cases is the only practical approach presently available. Progress in the control of tuberculosis, however, has been substantial since the turn of the century. However, it still remains a serious problem particularly for the many disadvantaged among the population. Incidence at around 1,200 new active cases each year persists with very little reduction from year to year reported. Last year (1970) actually saw an increase of nearly 50 cases over the preceding year. Most of the cases seek out medical attention themselves because of symptoms rather than being “found” by various casefinding techniques. The public and providers of medical services would do well to divest themselves of any over-confidence about TB having become a thing of the past.

Bad Diet State Problem

One out of every four North Carolina families is undernourished, according to findings of a state-wide nutrition survey recently released by the N. C. State Board of Health. Findings also revealed that nearly half of the state's preschool children have nutritionally substandard diets.

North Carolina's nutrition survey came in the wake of a national survey on hunger in America which focused mostly on low income groups. North Carolina was not included in the national nutrition survey. Gov. Bob Scott ordered the survey in an effort to accurately measure the problem in the state.

North Carolina is the first state to attempt to scientifically investigate whether its citizens are eating foods necessary for proper growth and maintenance of good health. Another objective of the survey was to determine what factors prevent families from eating a proper diet.

Fifteen State Board of Health nutrition experts planned and conducted the survey which took nearly two years—a project financed entirely with state funds.

Over 1,000 families—involving about 4,000 persons—were picked at random from all sections of the state to answer questions about their eating habits. All regions, races, and rural and urban residences were included. Ninety percent of the selected families participated.

A rating system was developed to measure dietary intake. The system was based on the amount of nutrients (vitamins, minerals, etc.) and calories which should be eaten daily for proper nourishment. Using this yardstick, it was possible to place household diets into three categories: optimum, adequate, and inadequate.

Failure to eat a nutritionally sound diet as a child may lead to retardation of physical growth and brain development. Poor nutrition and severity of infection go hand in hand. Among other associated problems are complications with pregnancy and dental disorders.

Twenty-seven percent of the households examined had inadequate diets, while 43 percent of the preschool children ate nutritionally inadequate diets. The survey showed that height and weight of North Carolina children appear to fall below the national average.

Dietary inadequacy occurred with greatest frequency in households in Eastern North Carolina,



Dr. Ronald H. Levine (left), director of the Community Health Division, State Board of Health, Dr. Jacob Koomen, State Health Director and Gov. Bob Scott discuss a chart showing optimum, adequate and inadequate diet by household income. Basically, the chart presents a relationship between income and inadequacy of diet.

a section with lower average household incomes and larger average family size.

Survey findings indicated that income was important to the family's consuming an adequate diet. Forty-three percent of households with incomes under \$1,000 had inadequate diets compared with 24 percent with incomes over \$2,000.

Another significant factor was the absence of adequate food preparation facilities in the home such as refrigerators, stoves, and running water. Inadequate diets were more than twice as frequent in

households rated substandard for these facilities.

In an innovative survey twist, the nutrition knowledge of the homemaker was appraised. Adequate diets were found in 81 percent of the households in which the homemaker had "good" nutrition knowledge, as opposed to 71 percent among those with limited nutrition knowledge.

A surprise finding of the survey was that families participating in special food programs for the poor did not have better nutrition standards than the non-participating poor. Only 48 percent of food program participants had adequate diets while 54 percent of those eligible but not participating had adequate diets. The report also revealed that only 35 percent of eligible households were participating in the food programs at the time of the survey.

Gov. Scott announced in conjunction with release of the nutrition survey results the appointment of a study group consisting of nutrition professionals, consumers and representatives of the food industry to make specific recommendations for action, either administrative or legislative. Alluding to the fact that three-fourths of the households surveyed ate adequate diets, the governor stated, "For those who believe that .750 is a pretty good batting average, I would only say that when it comes to sufficiency of nourishing food for our citizens, we must hold in front of us as a goal the figure of 1,000 percent."

Health Agency Samples Air for Pesticide Residue

The Federal Environmental Protection Agency was formed in 1970 for the purpose of combining parts of several agencies concerned with pollution in all the environment.

The Federal Pesticide Program, one unit in the marriage of environmental agencies, has as its overall objective determining the problems generated by pesticide use and the resultant effects, directly and indirectly, on the health of man.

The Federal Pesticide Program is concerned with two basic areas of study — community studies on pesticides conducted in 14 states and state services projects conducted in 13 other states.

Community studies on pesticides are medically oriented and are administered usually in areas of heavy use. Purpose of this study is to determine the effect of long term exposure.

The service program, of which North Carolina is a participant, was established as a surveillance organization to define pesticide problems. The State Board of Health operates the program with federal funds. Through the cooperative venture (federal and state) it is hoped the state will continue the program on its own when the

contract expires.

The Pesticides Program, headed by W. A. Williams, deals directly with the human health aspects of pesticide usage in the state. The project consists of seven basic work areas—determining pesticide use patterns, establishing morbidity and mortality reporting systems, air monitoring, human tissue monitoring, reviewing legislation on pesticides, training public health personnel and monitoring other environmental components (water, wildlife, etc.).

Among the data collected is information on types and amounts of pesticide material used. Hopefully information on method of application, how the material is handled before, during and after actual application, will aid in identifying health-related problems associated with pesticides.

A laboratory has been established at the State Board of Health with the capability of assessing the pesticide content of water, tissue, food and other products that may be associated with human exposure. Samples collected through the air monitoring system are forwarded to the Oklahoma State Health Department for analysis. Samples are collected at stations throughout the country simulta-



W. A. Williams, pesticide program coordinator for the State Board of Health, removes the filter media from one of two sampling instruments located in Wake County. Filters are changed every 24 hours and the contents analyzed. The sampling instruments are moved to various locations in the state each year.

neously in order to obtain comparative readings.

Sampling is carried on in North Carolina during the summer months when pesticide use is generally heaviest. So far this year six samples per month have been taken since April. An average of about 50 are taken each year. Measuring pesticide residue in the air enables scientists to evaluate this avenue of exposure and its contribution to the overall pesticide exposure burden of the human population as compared to the more obvious exposure routes of food, water, and fiber. Only low levels of several DDT related pesticides have been recorded in North Carolina to date.

Another group of pesticides is organic phosphate compounds such as parathion and disyston.

This is the group that has created many problems in North Carolina because of its high toxicity. Scientists are always on the lookout for these pesticides in air samples but rarely find them because of their rapid decomposition. Levels of DDT that have been found are no greater than those found in other states.

"Based on results of the sampling program to date," Williams said, "there appears to be no basis for undue concern regarding the current level of pesticides in air. We know that the man who applies pesticides is subject to concentrated exposure. Our greatest concern, however, is how exposure affects the general population over the long term in the food they eat, the air they breathe and the water they drink."

N. C. Medical Centers Study "Hardening of the Arteries"

The Bowman Gray School of Medicine has been awarded \$3 million by the National Heart and Lung Institute for the development of a center for research on arteriosclerosis. It will be one of 13 such research centers in the United States.

Establishment of the Arteriosclerosis Research Center at Bowman Gray is part of a national effort to accomplish a breakthrough in finding a cure for coronary artery and cerebrovascular disease, two leading causes of death in this country.

The institute also awarded nearly \$2 million to the UNC School of Medicine to do research in thrombosis. The five-year grant will finance research aimed at finding a solution to problems of prevention, early diagnosis and improved treatment of thrombosis.

Arteriosclerosis, commonly known as hardening of the arteries, is the main cause of heart attacks and strokes. The disease is characterized by formation of fatty plaques, covered with scar-

like tissue, on the internal walls of the large arteries that serve the heart.

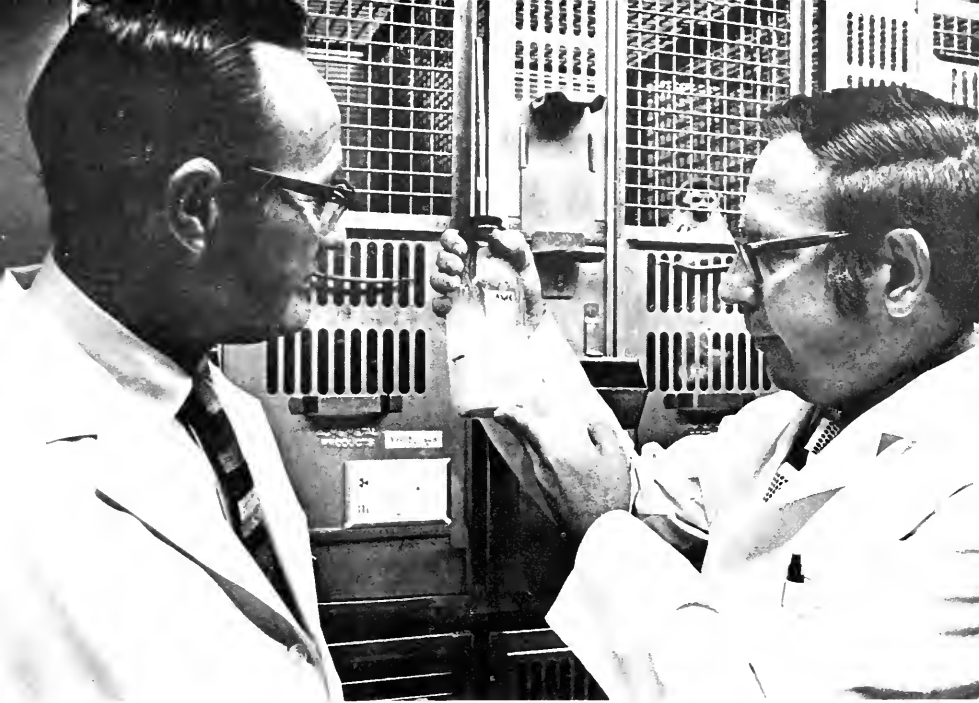
The centers will be concerned with studies on all aspects of the disease. Scientists agree that greater understanding of the disease, which is fast reaching epidemic proportions, is necessary before preventive and therapeutic measures can be improved.

Dr. Thomas B. Clarkson, director of the Department of Laboratory Animal Research, has been named director of the Bowman Gray project. Dr. Hugh B. Lofland, professor of pathology, will be co-director.

The research center represents a broad expansion of the medical school's arteriosclerosis research group which was organized 12 years ago. Accomplishments of the group in advancing knowledge of arteriosclerosis include the discovery that both White Carneau pigeons and squirrel monkeys develop the disease naturally, much in the same manner as humans.

The research program at Bowman Gray will be oriented toward experiments involving various types of monkeys. Six species of monkeys currently are used in arteriosclerosis research at the medical school. Plans call for development of other suitable animal models for studying the disease.

One of the major projects of the research program will involve studies to determine if a regression of the disease can be brought about by reducing the levels of



Dr. Hugh B. Lofland Jr., (left), professor of pathology and Dr. Thomas B. Clarkson, professor of laboratory animal medicine, check a high-cholesterol formula which is part of the diet of one group of monkeys used in arteriosclerosis studies at the Bowman Gray School of Medicine.

cholesterol in the blood of experimental animals. More importantly, researchers will attempt to find out if such a regression would result in improving circulation function in the animal.

This work could lead to the development of better methods of treatment for human patients. It is not known at present whether commonly used methods of treating patients who have had heart attacks or strokes actually reduce the size of obstruction plaques in the blood vessels or improve circulatory function.

Subprojects related to the study on the regression of arteriosclerosis include evaluating circulatory impairment during the develop-

ment of experimental arteriosclerosis and the degree of functional improvement during regression of the disease. An attempt will also be made to determine the extent to which the functional capacity of the heart is compromised in moderate or severely diseased monkeys and whether improvement results when the occluding lesions regress.

Dr. Clarkson pointed out that no single species of nonhuman primates can be considered to be an ideal animal model. He said the aims of the project are to provide information that will permit investigators to choose animal models best suited for their part in the study.

new hope for heart patients—

NOW, Diseased Hearts Can Be Repaired

AN amazing new heart operation now being performed at the UNC Medical Center at Chapel Hill is miraculously revitalizing people who have been totally crippled mentally and physically by heart disease.

A team of heart surgeons, headed by Dr. Ben Wilcox, a drawling 39-year-old native of Charlotte, has been performing revascularization (bypass graft) operations on the human heart since last December. They have achieved remarkable success.

Angina pectoris, a condition marked by spasmodic attacks of intense suffocative pain, occurs when the blood supply to heart muscle is diminished. Dr. Wilcox pointed out that the exciting thing about the bypass graft operation is that it has enabled angina sufferers taking up to 40 nitroglycerin tablets per day to control heart pain to return to a full schedule of work—completely free of pain.

Over 500,000 people die of coronary heart disease in America each year. Dr. Louis Wilson, a 34-year-old member of the UNC surgical team, said that current experience suggests that more than 70-80 percent of all patients disabled with coronary heart disease can be operated on successfully. "Assuming the procedure's current success is borne out over the next few years, great demand will be placed upon surgical teams throughout the country," he said. Present indications are that the operation carries a risk of from three to fifteen percent, depending upon whether one or all three coronary artery branches are involved.

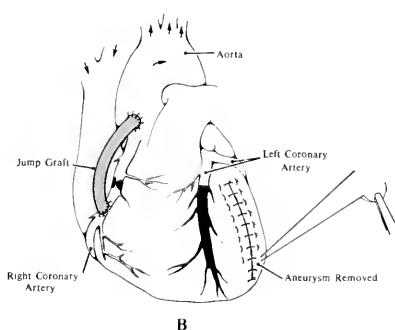
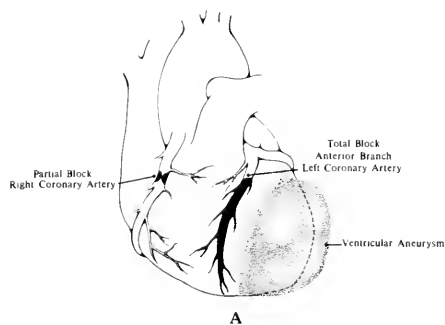
The operation is made possible by the angiogram, a fluoroscopic diagnostic technique that defines the exact location of occluded vessels in the heart. The angiographic technique was given a boost as far back as 1929 when Dr. Werner Forssman passed a catheter into his own heart via a su-

perficial vein in the arm during his lunch break. In order to prove the validity of the procedure, he then went to X-ray and had the location of the catheter verified in his heart. Dr. Forssman along with three other doctors were awarded the Nobel Prize for their achievement in the area of heart catheterization.

Today the technique consists of inserting a catheter with a curved tip into either the arm or leg artery to a point at the base of the aorta—the main vessel carrying blood from the heart. The catheter is then passed into the pumping chamber (left ventricle). A small amount of contrast dye is injected in order to locate the catheter tip. Once the position of the catheter has been insured, dye in a large enough dose to outline the area is injected under pressure. Simultaneously, movies are taken of the procedure. This allows surgeons to study trouble spots to the extent that they choose. Walls of the pumping chamber are studied for weak areas that might signal a developing ventricular aneurysm—a bal-

looning out of the pumping chamber wall that has been weakened due to a heart attack. The condition is marked by an abnormally large and insufficient chamber, which cuts down on the efficiency of the heart muscle to pump. Next, the catheter is passed through the trunk of the coronary artery to a point where the vessel separates into three branches on the surface of the heart. The purpose of the coronary artery is to supply heart muscle with a nourishing supply of blood. Extreme care is taken not to obstruct the flow of blood with the catheter tip. A small amount of dye is injected in order to outline the arteries for evidence of life-threatening blocks.

The days, sometimes weeks, of collecting diagnostic evidence are now completed and the decision is made whether or not to operate. For the patient, who lives between the hovering shadows of death from heart attacks or a stroke, and perhaps many additional years of life that the operation could give, it is time for a decision. For some timidity prevails and they take their chances. Most, however,



elect to have the operation. "It is rewarding to see positive results in a patient," Dr. Wilcox said, "to see him walk across the room without becoming exhausted—to see him return to his family and community as a functioning individual."

At 6:00 a.m. on the day of the operation the operating room, chocked full of exotic equipment and one of the most modern in the country, is a beehive of activity. Efficiency and coordinated activity is the order of the day and the smartly drilled supportive staff exhibit their qualifications in every department. The patient arrives in the operating room at 6:30.

Dr. Wilcox arrives about 7:30. The unassuming surgeon, who had spent a good portion of the night reviewing film and X-rays of the patient, checks charts and confers with those who have brought the patient to the present time in the operating schedule.

The operation begins in two phases. Part of the team will remove the saphenous vein from the right leg, while Dr. Wilcox and his assistants will open the chest. All is in a state of readiness.

A technician slaps the palm of Dr. Wilcox's out-stretched hand with the handle end of a scalpel. With a competency born of years of study and practice he draws the knife in a totally professional manner down the center of the chest. The incision extends from above the breastbone to just above the navel. It curves off slightly to

the left over the abdomen in order to provide better access to the left side of the heart. Dr. Wilcox uses a specially designed electric saw to split the breastbone, starting at the lower aspect of the bone and moving swiftly toward the neck. A retractor is used to spread the breastbone bringing into view the sac (pericardium) containing the heart. The sac is incised in an up and down manner, exposing the heart.

Meanwhile, the second and third assistants are busy removing the saphenous vein from the leg. The incision extends from the groin downward to slightly below the knee on the inside of the leg. Once dissected free, excess tissue is removed from the vein and a solution forced through to make sure it is functional. It is reversed before becoming a part of the heart's circulatory system in order to prevent the valve system peculiar to the venous system from interfering with the flow.

Dr. Wilcox and his assistant continue preparation of the heart for insertion of the new artery. They will be working with heart arteries no bigger than the lead in a pencil. It is necessary, therefore, to put the patient on the heart-lung machine in order to get good connection of the vein to the coronary artery. A section of the inferior vena cava is clamped off and a plastic tube attached to the heart-lung machine is inserted. The same procedure is followed with the superior vena cava. Both veins collect blood from the body



Dr. Ben Wilcox gives Elmer Willis of Beaufort, N. C., a checkup six weeks after receiving the jump graft surgical procedure on the heart. Before surgery Willis was almost totally incapacitated with angina pain. The operation has given him a new lease on life.

and return it to the heart. The patient's heart is arrested with an electrical fibrillator and its function taken over by the heart-lung machine. Blood is now being returned to the heart-lung machine, instead of the heart, where it is oxygenated and pumped back through the major arteries above the heart.

The angiogram revealed significant disease in two major coronary arteries. A branch of the left coronary artery has been totally occluded and there is partial occlusion of the right coronary ar-

tery. The total occlusion has resulted in the development of an aneurysm of the left ventricle. No alternative is left the surgeon but to cut away the dead heart muscle since an attempt to provide a blood supply to the area via a bypass graft would be fruitless. Dr. Wilcox, working swiftly and methodically, incises the aneurysm and empties the pouch of nearly a handful of coagulated blood. The dead tissue is dissected away and the chamber closed. Music filters from a speaker on the wall as the nimble-fingered surgeon quickly

turns his attention to attaching the vein transplant to the distal portion of the right coronary artery bypassing the partially occluded area previously outlined in the preoperative study. He then attaches the other end of the transplant to the aorta, the main artery of the body.

The low-keyed commander of the operating team now turns his attention to removal of the patient from the heart-lung machine—one of the most critical moments of the operation. The operation has been done under hypothermia (the patient's temperature has been lowered to a range of 85 to 90 degrees Fahrenheit in order to prevent damage to the heart during the operation). He must now make sure that it returns to normal. The heart is given an electrical jolt with a defibrillator. It works, normal rhythm is restored. The heart-lung machine is discontinued. When Dr. Wilcox has assured himself that hemorrhage has been controlled, the incisions are closed.

The patient is now taken to the intensive care unit where he will be watched closely for any signs of difficulty. Dr. Wilcox explained that the stress of the operation sometimes causes abnormal rhythms of the heart during the immediate postoperative period—a dangerous condition that could lead to collapse of the circulatory system. In intensive care, arterial and venous pressures are monitored constantly, along with the heart electrical impulse. To make sure

the patient maintains adequate lung ventilation he is placed on an artificial breathing machine for 24 hours after the operation. If all goes well the patient will be returned to a private room after two to three days and released 10 to 14 days following surgery.

Dr. Wilcox sags to a nearby stool as the patient is wheeled out of the operating room. He has stood in one spot for six and one-half hours. He is bushed, but he takes a minute to talk about the bypass graft procedure. "The bypass graft is not the answer to coronary artery disease," he allowed. "The answer will come in prevention. As of now, however, the best method of treatment in many cases is surgery."

Will the catheterization technique someday be used as part of the annual physical examination to detect heart lesions? "Not soon," says Dr. James J. Morris, director of Duke's cardiovascular laboratory. "It will take a number of years' experience and constant evaluation of the operation before most surgeons will commit themselves to operating on a patient whose lesions do not impair his function in life."

At any rate, developments in the field of surgery have revolutionized the treatment of heart disease since the German surgeon, Dr. Theodore Billroth, stated in the late 1800's, "Let no man who hopes to retain the respect of his medical brethren dare to operate on the human heart."

State Of North Carolina Vital Statistics Summary

	May 1971	Year to Date 1971
Births	7,463	39,229
Deaths	3,720	19,098
Infant Deaths (under 1 year)	178	924
Fetal Deaths (stillbirths)	132	628
Marriages	4,053	16,931
Divorces and Annulments	1,260	5,834
Deaths from Selected Causes		
Diseases of the heart (all forms)	1,324	6,991
Cancer (total)	575	2,760
Cancer of trachea, bronchus and lung	117	565
Cerebrovascular disease (includes stroke)	455	2,317
Accidents	276	1,331
Motor vehicle	130	681
All other	146	650
Diseases of early infancy	94	475
Influenza and pneumonia	125	650
Bronchitis, emphysema and asthma	51	307
Arteriosclerosis (hardening of arteries)	59	300
Hypertension (high blood pressure)	15	103
Diabetes	79	351
Suicide	70	260
Homicide	49	245
Cirrhosis of liver	46	247
Tuberculosis, all forms	7	41
Nephritis and nephrosis (certain kidney diseases)	23	128
Infections of kidney	19	126
Enteritis and other diarrheal diseases		
(stomach and bowel inflammations)	3	42
Ulcer of stomach and duodenum	11	44
Complications of pregnancy and childbirth	3	13
Congenital malformations	39	213
Infectious hepatitis	1	9
All other causes	396	2,145

Marriages, divorces and annulments are by place of occurrence, all other data are by place of residence.



"What time do we wake her in the morning?"

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On the Cover

A spokesman for the N. C. Hospital Association recently reported that many hospitals in the state are faced with a critical nursing shortage. Some have had to close whole wings because of a shortage of nurses. Others have had to delay establishing new services such as intensive or coronary care units, because to do so would have left the hospital short of nurses in other areas. Supportive personnel have eased the shortage of nurses in some instances, but many duties remain that only a registered nurse is permitted to do.

COMMENT

...to help a child hear



Dr. Burroughs

By
Dr. Ruth Burroughs
Chief
Crippled Children's Section

Helen Keller once said that deafness is a much worse misfortune than blindness because it means the loss of the most vital stimulus, the sound of the voice that brings language. Language is the primary tool of learning and a child with a hearing impairment might well be compared with other culturally deprived children who may never be able to catch up to their peers. Therefore, it is the responsibility, if not the privilege, of everyone who is associated with children, to be aware and alert to the problem and to see that the hearing of every child is tested early in life with simple noisemakers and as soon as possible with an audiometer. Few children are totally deaf. With proper amplification and/or education in the preschool years, a child with minimal hearing may acquire useful skill in language and may be able to learn to live in a "hearing" world and to compete in a normal school with his normal peers. The cost of a few years of preschool special education, will be far less than many years of schooling in a residential setting. More teachers of the hearing handicapped and more facilities will undoubtedly be needed and there must be available people willing to find and guide and assist every young hearing-impaired child and his parents.

Nursing Shortage?...Yes-No ... BUT

"Since the number of nurses has more than kept up with the growth in population in this country, as well as in North Carolina, the existence of a nursing shortage can be questioned," according to Lucy H. Conant, dean of the School of Nursing, University of North Carolina. She points out that there were nearly 3,000 licensed registered nurses in the state who were not in practice in 1969-71.

Dean Conant says that it has become customary today to use terms such as "crisis" and "cross-roads" to describe nursing, and she admits that they may be apt descriptions for nursing in 1971 in some instances.

"Mainly, nursing today faces a decision—either to change the nature of nursing practice in response to the needs of the public for health services or face the danger of oblivion," the nursing

educator said. "If we do not help to provide these health care services, others will take our place. In change there is always risk.

"Today the knowledge and skills of nurses frequently are being under-utilized. Nurses are dissatisfied with what they are doing, and so is the public. Basically the problem is that we are not practicing at the level at which we could practice, and in so doing, provide the type of health care services that are badly needed.

"The prototype of tomorrow's nurse is the nurse-midwife, the pediatric nurse practitioner, the family nurse practitioner, and others. It is obvious that nurses can be prepared to assume additional responsibilities in providing patient care. It is also becoming evident that this is a role which is attractive to many nurses—that they see this as an op-



"... the ill-defined role of the nurse and the misuse of her abilities are critical issues . . ."

portunity and a challenge.

"In many ways these new educational programs and practice roles are merely making legitimate activities that nurses have been doing for years. This is particularly true for public health nurses and for nurses working in physician offices and in small community hospitals. Frequently the nurse is the only person present when care is needed and she does the best she can under the circumstances."

Dean Conant views the widening role of the nurse as only the beginning in providing specialized health services. "In a few years the practice of nursing will in-

corporate the roles and responsibilities that we have known heretofore as being special and different. The basic issues are those of implementation and utilization. She says it is essential that nursing education and nursing service organizations keep up with developments in nursing practice. Too often nursing education and nursing service have acted in isolation from each other and this is something we no longer can afford to do.

"At the University of North Carolina we have been actively involved in developing a family nurse practitioner program. It is a six-month training program for

nurses to provide primary health care to individuals and families in clinics, health centers, and physician offices. The family nurse practitioner is a practitioner who is prepared to make independent judgments and to assume principal responsibility for primary health care of individuals and families in organized services.

"There is interest in a program for nurses in emergency rooms, especially in small community hospitals which do not have interns or residents. Here nurses would need much of the knowledge and skills taught family nurse practitioners in addition to knowledge of how to deal with acute trauma and life threatening situations.

"There is developing interest in the possibilities of a nurse-midwifery program, with particular emphasis on needs in rural areas and family planning. There is also need for a medical nursing program to prepare nurses for additional responsibilities in the care of chronically ill patients, both those in nursing homes and other institutions as well as in the community.

"Nurses and physicians must learn to practice cooperatively. Medical and nursing students complain that they never see a patient care team in action, much less have the opportunity to work together as a team themselves. If these new practitioner programs are successful in modifying the practice of nurses and physicians, it will in large part be because

they make it possible for nurses and physicians to function effectively as a team. Meanwhile medical and nursing schools are realizing that they are not at all well organized for interdisciplinary teaching and practice programs within the clinical areas."

Nurse drop-out rate high

Patricia J. Gendreau, associate executive director of the N. C. State Nursing Association, questions whether increasing the number of nurse practitioners will solve problems related to the health care crisis. Miss Gendreau pointed out, however, that statistically more nurses are needed. In 1969, there were 338 R.N.'s per 100,000 population in the United States; North Carolina has 244 R.N.'s per 100,000 population. In 1969 there were 14,470 R.N.'s in active practice in our state and the projected need is for 18,200 active nurses by 1975.

She notes further that there are approximately 13 counties in the state which have less than 10 nurses in practice and 10 counties which have five or less. "It is a question not only of numbers but apportionment of those in practice," she added.

"Nursing is a predominately female profession with inherent problems unlike other disciplines," Miss Gendreau said. "The 'drop-out' rate in nursing is high and research has demonstrated that this is largely due to job dissatisfaction. Too, women leave their work to raise families and,

then, returning to nursing 15 to 20 years later, find that the rapidly changing health scene has rendered many of their skills obsolete. Another interesting aspect is the turnover rate in employment which has been estimated at 70 percent. In other words, an average health agency will have to replace seven out of 10 nurses during one year's time.

Re-educate nurses in practice

"Realities affecting life are affecting provision of health care and nursing; population increase, mobility, computerization, socioeconomic demands and incessant flow of new knowledge and technology are a few actualities compounding the problems," according to Miss Mary McRee, executive director, N. C. Board of Nursing. "All of these, incorporated in varying degrees in educational programs preparing nurses, must be included also in the continued education of nurses in practice.

"Substantial change is needed in providing nursing services to capitalize on abilities of personnel, other than nurses, in patient care. As the registered nurse gains more knowledge in new competencies she will more willingly delegate appropriate activities to lesser prepared personnel. She will find new ways of assigning personnel for patient care and developing communication, with directional tools, to achieve nursing care and thereby increase the number of patients for whom she

can be responsible.

Miss Gendreau, too, doubts whether or not today's nurse is able to utilize her knowledge and skills to the fullest extent possible within the present health care delivery system. She cited a recent study which showed that only 25 to 50 percent of a nurse's time is spent in actual patient care. "Nurses are deluged with clerical work, supervision, administration of units and training orderlies. It would seem logical that the nurse, who is educationally prepared to give health care, should be relieved of these non-nursing functions and returned to caring for the patient and his family. The ill-defined role of the nurse and the misuse of her abilities are critical issues.

"Commitment to nursing as a career would be enhanced," she allowed, "by better working conditions, opportunity for nurses to have a voice in planning, and an active part in decision making related to basic care, improved salaries, more opportunities for continuing education and advanced academic degree preparation and recognition of the nurse as a professional member of the health team with unique and specialized knowledge and skills."

Miss McRee, however, cautioned against categorizing certain activities as "nursing only." She suggests that perhaps nurses can change when assisted to be comfortable with today's competencies through educational opportunities.

Return of The Midwife

The practice of midwifery is as old as the human race. Its history and its functions antedate any record of medicine as an applied science, according to David G. Warren, associate professor of law, Institute of Government, Chapel Hill, who recently researched the subject for the UNC School of Nursing.

...but now they're different

It has been estimated that the acute physician shortage—of both obstetricians and general practitioners—will result in four of every 10 babies being delivered in the United States in 1976 without a doctor of any kind in attendance. Warren notes that estimates of this type, together with the appallingly high infant mortality rate in the United States, have resulted in an urgent search for new approaches to maternal care.

One suggestion that has already been put into limited operation is to return to the basic principles of midwifery, training and educat-

ing registered nurses to make them valuable members of an obstetrical team.

Researching the subject further Warren discovered that the first records of midwife training in North Carolina dated back to the 1770's. The practice was fostered by economic necessity and the scarcity of doctors. It survived on inertia and was surrounded by superstition. That the midwife, or granny, depended entirely upon "toddlies, cheerful conversation and numerous concoctions for aid in her deliveries" is evidence of the level of her skill.

By 1920, 4,000 midwives were managing at least one-third of the deliveries in North Carolina. Pregnancy was second only to tuberculosis as the leading cause of death.

A war against the granny-type midwife was declared. In 1917, the General Assembly required midwives to secure a permit from the State Board of Health or a local health department and to register with the local health director in order to practice. An educational program was also started. Predictably, midwifery declined. There were about 50 in the state in 1970, a drop of 6,500 from 1925.

"The demise of the practice of the granny-type midwife signals a victory for modern health care in North Carolina," Warren allowed. "After centuries of her practice and generations of battling her existence, the granny is gone—hopefully, never to return."



WARREN (. . . in search of a new approach to maternal care)

Warren learned that the midwife's departure, however, did not solve all the obstetrical problems. In 1960, 10 countries had an infant mortality rate lower than the United States. By 1967, the infant mortality rate had improved slightly, but had dropped to 12th position worldwide. North Carolina's infant mortality rate is even higher than the national average.

North Carolina has one of the nation's lowest physician-to-population ratios—about 69 physicians per 100,000 civilian population in private practice. The article states that the declining number of general practitioners, especially in rural areas, is particularly acute.

Warren pointed out that no one

is advocating a return to the granny-midwife as a means of easing the physician shortage. However, a number of highly respected individuals and institutions are forcefully advocating a modern, educated, well-trained corps of nurse-midwives or obstetrical assistants as one good answer to the problem.

There are approximately 1,000 certified nurse-midwives in the United States today. A modern nurse-midwife is a registered nurse who has graduated from one of 10 midwifery schools approved by the American College of Nurse-Midwifery. Post-registered nurse programs from six to eight months and master's degree programs from 12 to 24 months

are offered.

Though the nurse-midwife of today is equipped to give excellent prenatal, delivery and post-natal care, she is a member of an obstetrical team and is always in close contact with and under the supervision of a physician. The nurse-midwife is trained to detect deviations from normal pregnancy and will return the patient to the obstetrician if any abnormality is noted.

Warren's research turned up the fact that only 45 percent of the deliveries in this country are

attended by obstetricians and there is always a shortage of obstetrical skill. The nurse-midwife will allow doctors to devote their attention to those who need it most. This would not be a revolutionary development; 80 percent of the world's babies are delivered by midwives.

North Carolina has already entered the field of nurse-midwifery to a limited extent. There are now two practicing, certified nurse-midwives at N. C. Memorial Hospital and patient regard for them is high.



"BETTER WATER FOR NORTH CAROLINA WEEK" . . . Lt. Governor Pat Taylor displays a certificate proclaiming "Better Water for North Carolina Week." Shown also is Leslie Matthews (left), chairman of the N. C. Water Works Community Relations Committee and Marshall Staton, director of the Sanitary Engineering Division of the N. C. State Board of Health.

Health Laws

(1971)

We list here some of the major health legislation and amendments passed by the 1971 General Assembly.

In most instances the State Board of Health will be charged with the responsibility of establishing guidelines, as well as implementing the measures.

The 1971 General Assembly displayed a keen interest in health legislation, especially in the areas of the environment, pesticide safety, day-care facilities and regulating the growth of small public water systems.

The following is an attempt to define intricate features of some of the new health laws and amendments, note their origin and explain their intent.

The 1971 General Assembly appropriated money for a kidney program in North Carolina. The program will primarily aid sufferers of kidney diseases who need dialysis or a kidney transplant. It is estimated that there are about 300 people in the state who might benefit from the program each year.

A special advisory council is formulating policies on how funds can best be spent to help those who no longer have normal kidney functions. To many of them it will offer an opportunity to again lead a productive life.

Certificate of Need (Nursing Homes)

The measure requires that prior to establishing additional health facility beds a certificate of need be obtained from the state licensing agency.

The certificate, issued by either the State Board of Health, Medical Care Commission or the State Department of Mental Health, will be based on recommendations received from the appropriate approved Area Wide Comprehensive Health Planning Council.

Requirements for certificate of need should ensure that costly development of nursing homes and hospitals will be accomplished in an orderly manner—reducing unnecessary duplication to a minimum. The legislation should also help ensure the development of the appropriate type and number of facilities.

Training Family Nurses

The General Assembly provided funds for training Family Nurse Practitioners. The Child Health Section of the State Board of Health is implementing the Pediatric Nurse Practitioner phase of the program through various schools of nursing. The training of some 80 nurse practitioners should be completed during the first year of the program.

The program will enable more children to be cared for in child health clinics. It should also facilitate better use of medical personnel.

Licensing Private Home Health Agencies

The lawmakers passed a bill providing for the State Board of Health to license private Home Health Agencies whether operated for profit or not.

The State Board of Health will develop rules and regulations governing the care, treatment, health, safety, welfare and comfort of patients served by such home health agencies.

The legislation will enable private home health agencies to receive reimbursement under the federal Medicare and Medicaid programs. Governmental agencies are exempt from the license requirements.

N. C. Pesticide Law

The 1971 General Assembly enacted the N. C. Pesticide Law which will be administered by the Department of Agriculture and governed by a seven-member policy board.

The main points of the legislation affecting public health are the "restricted use" provisions and "dealer licensure."

The pesticide board will develop a list of restricted use pesticides, mostly the more poisonous compounds, which will be available only from a licensed dealer. To be licensed, a dealer will be required to take an examination to prove he knows the proper use of pesticides and the health hazards associated with their use.

The restricted use provision

means that certain pesticides will be sold for specific uses only and that purchasers will certify in writing at the time of purchase that the pesticides will be used according to directions.

Dealers in pesticides will be required to obtain a dealer's license. To obtain a dealer's license, a person must demonstrate that he has specific knowledge concerning pesticides. This stipulation is particularly important since the majority of users get information about pesticides from the dealer. The license provision is one way of ensuring that the dealer has acquainted himself with the pesticides he is selling.

Revised Immunization Laws

The 1971 General Assembly rewrote the state immunization laws and added measles to the list now required of children. The schedule already included diphtheria, whooping cough and tetanus (DPT—at least three doses by the age of one year); polio (at least two doses of trivalent oral vaccine or one dose each of monovalent oral vaccine by the age of one year); measles (one dose by the age of two years) and smallpox (one successful vaccination by the age of six years).

Smallpox vaccination has been required for children entering school in North Carolina since 1911. Through the years additional laws were passed requiring immunization against diphtheria, whooping cough, tetanus and polio.

No change was made in the provision of the law that enables guardians or parents who cannot afford to have their children immunized by a private physician to get the vaccine at their local health department without charge. In addition, provisions were made for exclusion from requirements of the law a child whose health might be harmed by immunization, or a child whose parents or guardians are bona fide members of a religious organization whose teachings are contrary to the administration of vaccines.

Workmen's Compensation Act Amendments

Until ratification of amendments to the Workmen's Compensation Act, many occupational diseases were not considered compensable. Persons experiencing disability from these diseases were not entitled to recover medical or lost time expenses. The amendments make all occupationally-induced diseases compensable and, in effect, do away with scheduled coverage that has been in use for over 35 years.

Byssinosis (Brown Lung disease) is now clearly compensable for the first time in North Carolina as well as other diseases acquired as a result of working in an environment where the employee is exposed to toxic substances.

The bill also provides for compensation to employees who have suffered permanent loss of hearing as a result of exposure to noise

in their work places. Included would be such occupations as textile weaving, rock drilling, wood and metal working and many other occupations not yet studied.

Licensing of Day-Care Facilities

Day-care legislation has been considered during several previous sessions of the General Assembly. A study commission conducted public hearings throughout the state and made recommendations to the 1971 session. The measure, as introduced, was based mostly upon those recommendations. However, the lawmakers made a number of changes before the bill was enacted.

A 15-member Child Day-Care Licensing Board is established and assigned certain responsibilities, including the employment of a director to administer the program.

The act sets forth standards for license and directs the State Board of Health, Building Code Council and Insurance Department to develop additional standards in their areas of concern.

Each day-care facility, those with six or more children, must register with the Board between January 1, 1972 and April 1, 1972, and be licensed by December 31, 1972. Each day-care plan, those with five or less, must also be registered with the Board. Facilities must pay an annual privilege license tax of \$2.00 per child.

A supplemental appropriations act allocated \$160,000 to the Child Day-Care Licensing Board for the 1971-73 biennium. It remains to be

seen whether this Board will make any payments to local health departments for inspections.

At this writing, the licensing board has not been appointed. Health and sanitation standards will be drafted and presented to the State Board of Health for approval.

Regulating Mass Gatherings

The purpose of this bill is to protect the public health, welfare and safety of those persons attending a mass gathering and those who live nearby and are directly affected.

A mass gathering is defined as a congregation in which admission is charged for profit and more than 5,000 people are present in an open space for a continuous period of at least 24 hours. Exempted are assemblies in permanent structures intended for large numbers of people.

The bill requires that the sponsors obtain a permit from State Health Director and sets forth procedures to be followed in applying for the issuance, denial and revocation of the permit.

The State Board of Health is also required to adopt rules and regulations and standards so that facilities and services shall be provided as necessary to protect the health, welfare and safety of those attending.

Regulations are now being drafted for consideration by the State Board of Health at its next meeting in October.

Regional Water Supply Planning

The bill defines a Regional Water Supply System, outlines the functions and responsibilities of the State Board of Health and the Department of Water and Air Resources in regional water supply planning. It also establishes a fund with conditions and procedures to be under control and direction of the Department of Administration.

Purpose of the bill is to promote the creation of regional and county-wide water systems with adequate interconnections to provide an adequate supply of water. The measure is also designed to make supplies less vulnerable to recurring drought conditions and to have systems large enough to justify the cost of adequate facilities and of proper operation and maintenance.

Small Public Water Systems

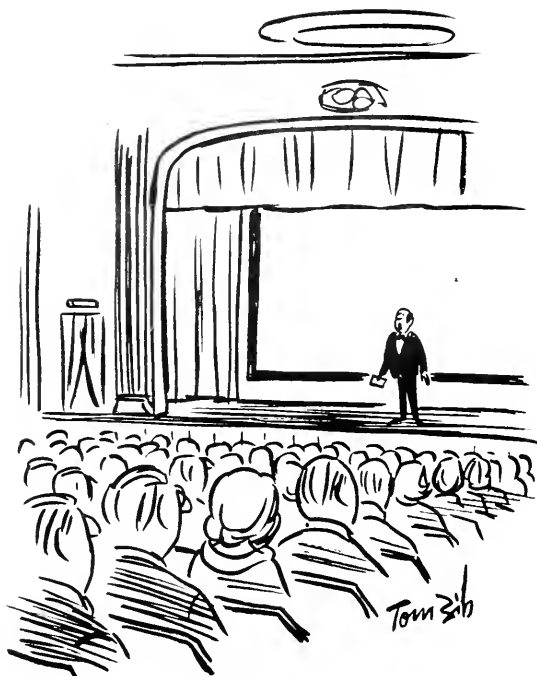
This legislation is designed to enable the State Board of Health to control the rapid growth of inadequate, unreliable and potentially hazardous small public water supply systems, to ensure that all public water supplies are safe for drinking and domestic purposes and to ensure that small public water supply systems are so designed and constructed as to permit interconnections with municipal, county or regional systems.

Provisions of this bill enable the State Board of Health to regulate the design of all new public water supplies.

State Of North Carolina Vital Statistics Summary

	June 1971	Year to Date 1971
Births	7,381	46,610
Deaths	3,514	22,612
Infant Deaths (under 1 year)	158	1,082
Fetal Deaths (stillbirths)	111	739
Marriages	6,298	23,229
Divorces and Annulments	1,440	7,274
Deaths from Selected Causes		
Diseases of the heart (all forms)	1,294	8,285
Cancer (total)	530	3,290
Cancer of trachea, bronchus and lung	93	658
Cerebrovascular disease (includes stroke)	424	2,741
Accidents	258	1,589
Motor vehicle	123	804
All other	135	785
Diseases of early infancy	93	568
Influenza and pneumonia	86	736
Bronchitis, emphysema and asthma	46	353
Arteriosclerosis (hardening of arteries)	39	339
Hypertension (high blood pressure)	14	117
Diabetes	78	429
Suicide	45	305
Homicide	52	297
Cirrhosis of liver	42	289
Tuberculosis, all forms	11	52
Nephritis and nephrosis (certain kidney diseases)	28	156
Infections of kidney	15	141
Enteritis and other diarrheal diseases (stomach and bowel inflammations)	8	50
Ulcer of stomach and duodenum	10	54
Complications of pregnancy and childbirth	5	18
Congenital malformations	31	244
Infectious hepatitis	2	11
All other causes	403	2,548

Marriages, divorces and annulments are by place of occurrence, all other data are by place of residence.



"Is there a urologist in the house?"

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OCTOBER, 1971

THE HEALTH BULLETIN

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On the Cover

Dr. Phillip M. Hutchins, assistant professor of physiology at the Bowman Gray School of Medicine, is attempting to define the cause of high blood pressure through research on the small vessels of a special colony of hypertensive rats. High blood pressure (hypertension) is a disease of the small vessels which regulate the flow of blood to the body's tissues. Such vital information as blood pressure, heart beats per minute and respiration per minute are recorded on laboratory animals being studied by Dr. Hutchins.

COMMENT

Dr. Koomen Re-appointed

Supreme Court Justice Susie Sharp is shown administering the oath of office to Dr. Jacob Koomen Jr. as State Health Director. Acting upon recommendation of the State Board of Health, Gov. Bob Scott recently confirmed Dr. Koomen's appointment to a second four-year term of office. Dr. Koomen became State Health Director in 1966 when he was selected to fill the unexpired term of Dr. J. W. R. Norton who retired. Dr. W. Burns Jones Jr. was also sworn in as assistant Health Director for another four-year term.



Blood Pressure Study Launched

Have you had your blood pressure checked lately? You could be one of an estimated 530,000 North Carolinians who have definite hypertension.

Hypertension (high blood pressure) has an unusually high incidence in the southeastern states. A chronic disease, it is characterized by a constriction of the small vessels which regulate the flow of blood to the body's tissues.

It is estimated that hypertension directly accounts for five per cent of all deaths in the United States and is the underlying cause of coronary heart disease, stroke and renal failure in an additional five percent of deaths.

In an attempt to reduce the mortality and other serious problems which result if the disease goes undetected and untreated, the N. C. Heart Association and the N. C. Regional Medical Program have initiated adult screening and referral programs on hypertension in certain areas of the state.

Meanwhile, Dr. Phillip M. Hutchins, assistant professor of physiology at the Bowman Gray School of Medicine, has begun research aimed at defining the cause of high blood pressure.

He is conducting his studies on

a special colony of white rats which could play an important role in the future development of improved methods of treating hypertension. These rats—the strain was produced in Japan—develop high blood pressure naturally, much in the same manner as man.

Chemical agents presently used in the treatment of the illness are effective in reducing blood pressure but they do not attack the cause of the disease.

With the help of his rat colony, Hutchins hopes to determine what functional changes take place in the small arterioles and venules during the development of hypertension; how the small blood vessels react to certain stimulation; and what treatment agents would be effective in restoring the small vasculature to a functional state.

In the early stages of the research, Hutchins plans to study the differences in the small vessel patterns of the two strains of rats. Through the use of high magnification, the small vessels in the thin muscles of the research animals, as well as the blood flow through these vessels, can be seen.

His microscope is equipped with a camera to photograph what is taking place in the vasculature.



Through the use of a television camera attached to a microscope (left), Dr. Hutchins (second from left) can record experiments on video tape for future study. The scene above shows the blood flow through an arteriole in the thin muscle of a hypertensive rat.

A television camera also is used for the production of video tapes for future study. Another device will monitor the time it takes the blood to flow from one point to another point in the vessel.

It is recognized that fear, anger, pain and other situations of stress can cause the small blood vessels to constrict, elevating blood pressure. These conditions will be simulated by injecting certain hormones — adrenaline, norepinephrine and others — into the research animals and by stimulating their nervous system.

An aim of the work will be to determine if hypertensive rats react differently to the stimulants than do control models.

When it has been possible to identify the defects associated with early stages of high blood pressure in the research animals, the project will be shifted to a study of drugs which might be used to correct the problem.

Hutchins pointed out that his

studies are basic in nature and will deal only with hypertension in animal models. Nevertheless, the results of these studies could be significant to the future development of improved methods of treating patients with high blood pressure.

When that is accomplished it will be a brighter day for some 17 million Americans who are estimated to have definite hypertension.

A recent National Health Survey concluded that hypertension is "the most commonly encountered specific form of chronic disease."

The survey found that in age groups under 50 years, men are more likely to have hypertension than are women, whereas at older ages the relationship is reversed.

At every age covered by the survey the prevalence of definite hypertension was roughly twice as great in the Negro population as the white

Water is the most vital substance for sustaining life on earth. Without it thirst would overwhelm a person in a matter of days. The food we eat, the clothes we wear, and the household gadgets that give life its savor are grown or processed with the aid of water.

Each person in the city of Fayetteville uses an average of 150 gallons of water each day. The city, which has a population of 70,000, requires an average of 10

Water . . . Cool, Clean and Dwindling

million gallons per day—or 6,950 gallons every minute.

Like people across the country residents of Fayetteville use more water now than ever before and they are more conscious of its quality. The last 20 years have seen a vast increase in the use of appliances, most of which use water. Today, much emphasis is placed on personal cleanliness which requires water. Fayetteville has done a commendable job of meeting increased water needs.

The source of Fayetteville's water supply is four lakes, with a capacity of about 500 million gal-

lons when full and the Cape Fear River, which normally can supply up to 200 million gallons per day. The city is served by two filter plants. One plant with an eight million gallon capacity was placed in operation in 1969. Another dates back to 1943. The older plant originally had a capacity of three million gallons, but has since been expanded to 12 million. Thusly, the city has the capacity of 20 million gallons per day if called upon to operate at full force.

Water is pumped from the lake into mixing chambers—large concrete pits 16 feet deep. Here, a number of chemicals are added to make it pure and safe to drink. Chlorine is added to destroy bacteria. Lime and alum cause mud to coagulate into small particles called flock. Phosphate is used to coat pipes and prevent the water from becoming rusty and red.

Water flows by gravity from the mixing chambers to settling basins. During its route mud particles get bigger, heavier and eventually settle to the bottom. At this point about 95 percent of the mud and debris has been removed. The water then flows over a baffle wall, a concrete partition separating the settling basin from the filter, leaving residue in the basin. The final filtering process is composed of gravel and fine sand. The remaining five percent of impurities are removed as the water filters through the bed of gravel and sand.

As the purified water is pump-



W. S. Earley, chief operator, each hour checks samples as raw water is pumped in, as chemicals are added, as it goes into filters and when the finished water is pumped to the reservoir.

ed into storage tanks, more chemicals are added. By now the chlorine originally put in has been broken down by heat and sunlight. As a result the water is susceptible to re-contamination by bacteria during the period of storage. Post chlorine is added to make sure the water is free of bacteria before it is pumped into the home or business. Post lime is added to make sure acidity or alkalinity is within acceptable limits. Post fluoride is put in to prevent tooth decay.

The city stores its reserve of finished water in three one million gallon overhead tanks. Eight million gallons can be stored at the two filter plants.

Operators maintain an hourly check on the condition of the

water from the time it arrives in the mixing chamber until it is pumped into the home. The primary reason for the constant vigil is to check finished water for acidity or alkalinity and to determine whether or not bacteria is being controlled during the period the water is in storage. Samples of raw water are also analyzed as it is pumped in, as chemicals are added, as the mud starts to settle and when the water goes into the filter.

Mud is washed from the settling basins every two months. Filters are cleaned every three days. Water is forced through the filter bed of gravel and sand from the bottom cleansing the particles of accumulated impurities as they tumble from the force of the water.

Scientists say the demand for water will increase, not only in North Carolina, but throughout the country. Unfortunately, however, the country does not have an inexhaustible supply of water. About 630 billion gallons are available in the United States each day. An average of 350 billion gallons are used each day at the present time compared to 175 billion gallons only 25 years ago. It is the opinion of experts that we will have to consider reusing water before the saturation point is reached. Desalinization has potential, they claim, but the process is feasible only along the coast at present and it is expensive compared to the cost of treating regular water.

(2-in-1) Measles Vaccine To Get Push

The 1971 North Carolina General Assembly enacted a revised immunization law which added measles to the list of communicable diseases for which children must be inoculated before their second birthday.

Combined federal and state funds totaling \$1.3 million were earmarked for the State Board of Health for purchase and distribution of measles and rubella (German measles) vaccines.

The Immunization Section of the State Board of Health is charged with carrying out programs aimed at wiping out measles and rubella.

Measles was once considered a relatively harmless disease which children had to experience as part of growing up. However, expanded medical knowledge has put to rest that notion. Before the vaccine was perfected in 1964, hundreds of children died from measles and many more suffered complications.

"Measles is a serious childhood disease," explained John Irvin, coordinator for the North Carolina immunization program. "So

far this year, there have been approximately 20,000 cases of red measles in the state. There is absolutely no reason for even one of these children to have caught the disease.

"The child with measles usually spends seven to 10 days in bed. The high temperatures can lead to encephalitis (inflammation of the brain), which may cause mental retardation. Other complications may include eye damage, heart defects, or pneumonia. With the vaccine, a child can be spared this experience," Irvin said.

Approximately 880,000 children in the state need either measles, or rubella vaccine, (or both) out of a total population of 1.2 million children age one to 12, according to a survey recently conducted by the Immunization Section.

"Compared with 53 states and territories, North Carolina ranks 50th in immunization levels against rubella, and we rank low in measles immunization as well," Irvin said. "One reason used to be lack of financing, but this is no longer a problem. Another problem was the inability of some health departments to gear up for massive immunization programs.

"One of the major reasons, however, was that up until this past summer, we could not vaccinate kids against both rubella and measles at the same time. A combination measles and rubella vaccine was perfected this summer (1971). We can now give both immunizations in one shot," Irvin said

Irvin commented that many people are less motivated to immunize against rubella than red measles because rubella is such a mild disease.

However, rubella is selective in its severity. It zeroes in on a special defenseless group and strikes with devastating effect. "Approximately 15 percent of the adult female population is susceptible to rubella because they didn't have the disease as children. If these women catch rubella during

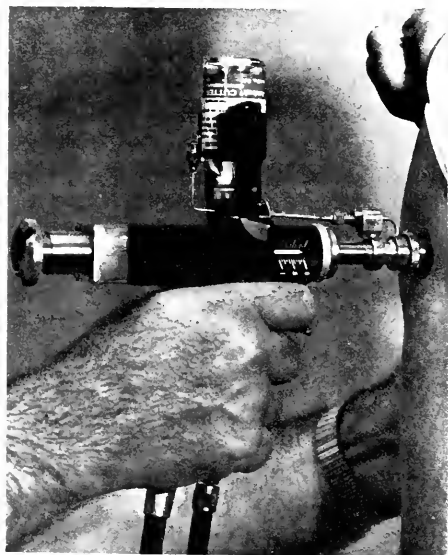
with multiple defects, not just one," Irvin said.

In addition to the measles vaccine, state law requires children to be immunized against diphtheria, whooping cough, tetanus (DPT) and polio before age one, and smallpox before age six. Current figures indicate that among North Carolina children under age one, only 40 percent have received adequate polio and DPT immunization.

When asked what he plans to do about these low figures, Irvin said, "We are not de-emphasizing polio and DPT immunization. It is a matter of priority. Right now, measles and rubella strike with greater frequency so they are given top priority.

"Our first concern is to immunize children through mass campaigns. This requires a two-fold approach. Two-thirds of the kids can be found in a captive audience, such as schools. We go into the schools (the mother doesn't have to take the kids anywhere) and we give them the combined measles-rubella vaccine. We reach the other one-third with an immediate follow-up clinic, at night or on Sunday afternoon. No charge is made when children are vaccinated in a mass situation.

"There is no excuse for the large number of unimmunized children. The \$1.3 million belongs to the counties. All they have to do is ask and we will provide the vaccine, supplies, promotional material, and our expertise."



Jet Injector Gun . . . it's practically painless.

early pregnancy, the chances are extremely good that their babies will be born blind, deaf, mentally retarded, with severely defective hearts or dead. It is the rule rather than the exception that such 'rubella babies' will be born

Perhaps the most effective battle against drug abuse in the state is being waged by students at the UNC School of Pharmacy.

It all started in 1969 when 17 pharmacy students volunteered for special training in various aspects of drug abuse. They would then go to public schools and "tell it like it is" on a student-to-student basis.

Last year, it is estimated that 55,000 students sat in on "give and take" powwows conducted by 60 UNC pharmacy students. Drug

answers and our students give them straight answers in an imaginative and well-coordinated program."

Berlow stated that drug abuse in our society is a serious problem. He warned that it affects adults, children, rich, poor, whites and blacks with equal devastation. He said students are particularly involved in the abuse of drugs. Some actively. Some experimentally. But all students have one thing in common—confusion about what it's all about.

UNC Pharmacy Students Wage Drug Battle

bull sessions were held in 225 schools throughout the state.

What do the students think of the pharmacy student's "one nighters?" Most think it's a groove. According to Professor Leonard Berlow, who initiated and directs the program, the response has been excellent. "Kids are fed up with scare tactics," he said. "Parents and teachers have attempted to frighten them away from drugs and sometimes the arguments they use do not tell the whole story. They want straight

Attempts to get the message across have been less than successful. With the student-to-student approach Berlow thinks a way has been found to bridge the communications gap.

The training plan for pharmacy students begins with a cram course on misused drugs. Students must also become skilled in the communications art. Before heading out to present programs, they must observe two actual sessions by experienced fellow students.

Berlow said most emphasis is



Members of the UNC School of Pharmacy student-to-student Drug Abuse program get ready to hit the road with straight-from-the-shoulder information about drugs. Last year, the pharmacy students visited 125 schools across the state and talked with over 55,000 junior and senior high school students.

placed on "telling it like it is" in answer to students' questions. The usual procedure is a general talk followed by small classroom get-togethers. Teachers and other adults are requested to make this part of the presentation a purely student-to-student gathering. "It's amazing how the kids open up with questions," Berlow said. "Youngsters tend to place more credibility in other students in their own age range. Too, they know that the pharmacy student, by the nature of his chosen profession, has a better-than-average knowledge of drugs and their effects." Berlow made it plain that pharmacy students "pull no punches" as they tell what they know about drugs.

An interesting spinoff of the

student-to-student program is the increasing number of community drug action committees being developed throughout the state. "An even more encouraging aside," Berlow noted, "is the willingness of adults to include students in their groups. After all, they're the ones saddled with the problem. It makes good sense to include them."

Support for the program in the past has come from the Z. Smith Reynolds Foundation. A substantial grant was recently received from HEW to carry on the program. It also has the support of the N. C. Department of Public Instruction which encourages schools to request the student presentations.

Berlow pointed out that there are a few things school officials should keep in mind about the student-to-student program:

"The overall mood of our presentation is one of casualness. A relaxed explanation is more effective than a tense, formal situation.

"The ideal group is without supervision. This assures that a genuine student-to-student atmosphere will prevail.

"It should be remembered that the pharmacy student has classroom obligations and matching dates and times may not always be possible."

Interested school officials should contact the UNC School of Pharmacy in Chapel Hill. You may also call Professor Leonard Berlow (919-966-1121) to coordinate a program.

Genetics . . .

blueprint for life

By
Dr. Cary Bostian
Professor of Genetics
N. C. State University

A new life begins when an egg of the female is fertilized by a sperm of the male. The two cells contain all that the new life inherits from the parents.

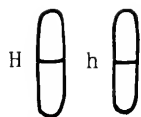
The fertilized egg contains the blueprint for the development of a human being, not just any kind of individual, but one which will be uniquely different from every other person, unless twins, triplets or larger numbers develop from a single egg.

At the beginning of a new life, there is a single cell, which will divide and divide until the newborn baby has around 200 billion cells, each with a copy of the blueprint which was present in the fertilized egg.

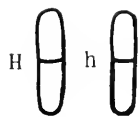
Differences in the hereditary blueprints provide for an endless variety of human types. The hereditary possibilities present in the fertilized egg gradually unfold as it becomes an embryo, fetus, child, youth and adult.

There is always present an environment, first prenatal and then postnatal, which can cause differences along with those which are inherited. Thus each of us is what he is at any time during life because of the hereditary constitution originally received and the nature of the environment in which he has existed up to that time.

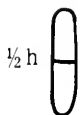
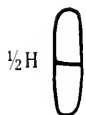
Frequent human interest stories in magazines and newspapers have made the general public aware of the hereditary cause of many defects and diseases. Doctors were slow to understand and appreciate the importance of genetics to their profession. Today, however, genetics is one of the most studied and fastest moving fields in medicine. More than 900 defects, disorders and diseases have been found to have a genetic basis. Occurring in around two percent of births, these are responsible for one out



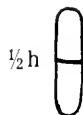
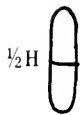
one pair of the
mother's chromosomes



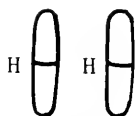
same pair of the
father's chromosomes



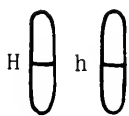
eggs made by the mother



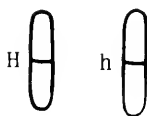
sperms made by the father



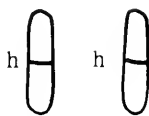
normal



carrier



carrier



Hurler's disease

four possible kinds of children

Hereditary units are represented by symbols "H" and "h". The "H" stands for the normal condition, while "h" represents the abnormal gene which if present in a double dose causes Hurler's disease. Science does not know which pair of chromosomes contains the "H" and "h" genes, but it is known that one pair does contain them. There is one chance in four that a child will be born with Hurler's disease if both parents are carriers.

of eight infant deaths and for the existence of thousands of children who cannot live a normal life. Only the parents of a defective baby with a short life expectancy can appreciate the heartaches and tragedies which follow the arrival of such children.

Antibiotics, new drugs, immunization, better nutrition and improved sanitation have reduced the incidence of diseases among children. As a result many of the causes of mortality and sickness, the types due to heredity, have proportionately increased. Although a cure has not been found for a single one of the 900 kinds of

hereditary conditions, about 100 of them can be treated and in around 50 of them the "carrier" or potential parents can be identified. (The term "carrier" refers to an individual who is normal or nearly so, but who can be the parent of an affected child.)

Recently a national magazine featured an article about a family with a two-year-old daughter with Hurler's disease (a disorder causing changes in growth and development) an incurable, fatal defect. This condition is said to be a recessive trait, because it can show up in a child of normal

(Cont. on next page)



Dr. Bostian

parents, if both of them are carriers of a hereditary unit, a gene, which when present in double dose causes the specific defect to be present.

Fortunately Hurler's disease is rare, but there are many other diseases which occur much more often, which are inherited in the same way. Two examples are cystic fibrosis, which occurs about once in every 1,000 births because 1/20 of all people are carriers, and sickle cell anemia, which occurs in one of every 500 black children.

The three diseases mentioned above occur as often in girls as in boys, but there are several serious defects which occur only in boys or if in girls, very rarely. Two of these are hemophilia, a defect in the clotting of blood which creates a risk of bleeding to death, and the crippling and always fatal

Duchenne muscular dystrophy. These are known as sex-linked traits, because the defective genes causing them are carried by the "X" chromosomes. Girls have two "X" chromosomes, one inherited from each parent, while boys have one "X" and one "Y", with the "X" coming from their father. Because the "Y" chromosome does not carry genes corresponding to those in the "X", half of the sons of a normal but carrier female will be affected.

For every inherited disease it is the goal of medical genetics to find the biochemical nature of the defect, because this information is needed in order to treat the disease, to identify the carriers, and to identify fetuses which will be born with the disease or defect unless the mother decides to have an abortion.

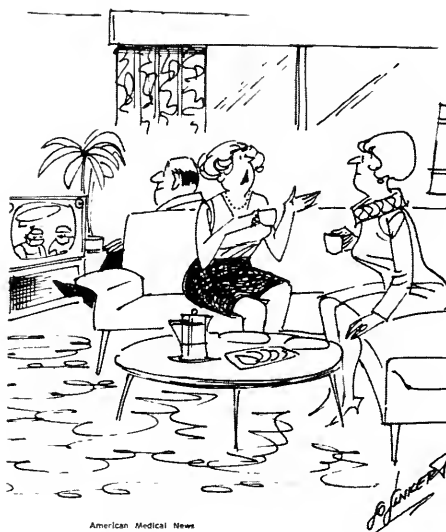
At the present time there is no way to cure an inherited disease. When so-called genetic engineering becomes possible, perhaps in another 50 years, some cures of inherited diseases will be possible. In the meantime, the medical profession will find new and better ways to treat the diseases and will look for ways to identify the potential parents so that they can be warned of the chances of having a defective child.

As described in the June 1971 issue of *The Health Bulletin*, genetic counseling is becoming available and will probably turn out in a few more years to be the most significant branch of preventive medicine.

State Of North Carolina Vital Statistics Summary

	July 1971	Year to Date 1971
Births	8,379	54,989
Deaths	3,749	26,361
Infant Deaths (under 1 year)	169	1,251
Fetal Deaths (stillbirths)	129	868
Marriages	4,808	28,037
Divorces and Annulments	1,281	8,555
Deaths from Selected Causes		
Diseases of the heart (all forms)	1,345	9,630
Cancer (total)	552	3,842
Cancer of trachea, bronchus and lung	134	792
Cerebrovascular disease (includes stroke)	460	3,201
Accidents	311	1,900
Motor vehicle	166	970
All other	145	930
Diseases of early infancy	120	688
Influenza and pneumonia	83	819
Bronchitis, emphysema and asthma	51	404
Arteriosclerosis (hardening of arteries)	46	385
Hypertension (high blood pressure)	17	134
Diabetes	72	501
Suicide	49	354
Homicide	56	353
Cirrhosis of liver	42	331
Tuberculosis, all forms	6	58
Nephritis and nephrosis (certain kidney diseases)	23	179
Infections of kidney	18	159
Enteritis and other diarrheal diseases (stomach and bowel inflammations)	6	56
Ulcer of stomach and duodenum	8	62
Complications of pregnancy and childbirth	1	19
Congenital malformations	32	276
Infectious hepatitis	11
All other causes	451	2,999

Marriages, divorces and annulments are by place of occurrence, all other data are by place of residence.



American Medical News

"My husband watches so many medical shows on TV I can only talk to him during visiting hours."

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On the Cover

Dr. M. B. Pate, Robeson County Health Director, examines a youngster at one of the department's many clinics. Robeson is the largest tenant farm county in the state. Three races of people of almost equal proportions depend mostly on agriculture for a living. Dr. Pate agrees that the combination of circumstances makes for a difficult public health problem. He maintains that in order to make any real headway "we must change the environment, or the people's reaction to their environment."

COMMENT

State Lab Tests for Rubella



Mrs. Carroll

By
Norma B. Carroll
Chief
Virology Section

The Virology Section of the State Laboratory faces many challenges in the delivery of health services. One example is providing laboratory tests on blood serum to indicate the presence of protective substances against rubella. A specific test is used to determine the immune status of an individual and to aid in the diagnosis of rubella. Providing this service in the volume required is a challenge. The goal of the program is the control of birth defects due to rubella. Results of this rubella test are invaluable in planning health care for the pregnant female. Twenty-five thousand tests are expected to be performed during 1971 compared to 12,000 in 1970 and 5,000 in 1969. Approximately 90 percent of the results provided by this service have been directed toward prenatal care programs. Little of this service has been utilized for premarital examinations and family planning programs and none for testing the effectiveness of vaccinations. A limited number of test results have been used in the diagnosis of rubella in the newborn. Only a few hospitals have used the service to evaluate the immune status of new employees of child-bearing age who work in high risk occupations. Evaluation shows 40 percent of the counties of the state have not used the service at all. It is possible that news of the availability of this prompt, reliable service has not been communicated in some instances to physicians, hospitals and clinics who might be in need of it. It should be remembered that test results can be furnished within 24 hours after receipt of the specimen excluding, of course, weekends and holidays.

Pill Popping in Suburbia

By
Dr. Ben Britt
Director
Drug Abuse Division
Dept. of Mental Health

Drug abuse has been defined as the use of a chemical agent, which affects the central nervous system (C.N.S.), to the point where it seriously interferes with health, social, or economic functioning. This has been a problem for various cultures throughout recorded history. Alcohol was used by western civilization, opium was used in the east, and tobacco, peyote, and cocaine were used by the American Indians. Modern science has developed new drugs, and modern commerce has made all these drugs available to more people.

During the past few years, a marked increase in drug abuse and its related problems, particularly among young people, has aroused concern of citizens and government. Private money and tax funds are being channeled into programs designed to curtail drug abuse. Abuse of illegal and dangerous drugs by young people is not a simple problem with a simple solution. It may reflect a

life style, promoted by their parents and reinforced by the rapid socio-economic and scientific changes of the past 30 years.

For, certainly, if one looks closely at mental hospital admission records in North Carolina, he will discover that middle-aged, middle-class America is solidly caught up in the drug scene. The type of drugs used may be different and reasons for their use may be more readily rationalized, but the effects are basically the same. The addict is reduced to a non-person whose contributions to family and society are halted in what could be life's most productive years.

Many middle-aged and middle-class people throughout North Carolina and the nation live in quite different socio-economic style from the pre-electricity, rural, farm economy of their childhood. Rapid socio-economic changes, keeping pace with scientific advancement, have created



. . . pills, pills, pills. Addiction is widespread.

new problems such as balancing the family budget; keeping up with the Joneses; controlling children who have lots of leisure time; avoiding unwanted pregnancy; seeing younger and more educated co-workers get the promotions; disciplining one's self to keep up the increasing pace of modern living; growing older with nothing constructive to do; and loneliness.

These and similar problems create personal frustrations, which may have no acceptable release. Tensions build up and symptoms may develop. These symptoms can include increased irritability, sleep disturbance, stomach upset, tension, constipation, headache, worry, and all sorts of aches and pains in various parts of the body. The individual who doesn't understand the cause of his discomfort may seek to find relief by taking something. Modern advertising bombards him with all sorts of promises for help

by taking a pill, tonic, or other preparation. The individual may try one or several of these. Some will increase the dose if it doesn't work.

Many individuals consult their physician for relief. They may be less than helpful in aiding him to find the correct diagnosis. He may not take time to explore the causes behind their symptoms. The patient usually wants immediate relief, and medicine, if used properly, can be of great help.

Sedatives and minor tranquilizers are frequently used for these nonspecific complaints. They relax tensions and relieve related symptoms. They are valuable drugs to help the patient over the acute situation. If used in therapeutic amounts, they do not produce dependency. However, they will not remedy the problems of modern living which caused the symptoms.

Many people have a tendency to

increase the dose, if relief is not obtained. Some individuals combine this with medicine from other sources. In one recent case, a woman was getting prescriptions for a minor tranquilizer from six physicians, filled in six different pharmacies, over a period of months. High dosage over prolonged periods will lead to drug dependency of a most dangerous kind. A physiological dependency develops in which the body needs the drug to function properly. When the drug is abruptly withdrawn, the person may suffer convulsions and death during the next several days.

Sedatives pose another serious hazard. Tolerance may develop for the desired effect while the lethal dose remains constant. Death may occur when the desired dose approaches the lethal dose, or when confusion from drug intoxication leads to miscalculation and overdosage. Large amounts of these drugs pose a special hazard of easy suicide for the despondent individual.

Middle-aged citizens often take a large variety of medications with or without prescriptions. These may include laxatives, vitamins, hormones, tranquilizers, minerals, tonics, sedatives, aspirin, antihistamines, cough remedies, antacids, decongestants, birth control pills, anticholinergics, etc. They may also use tobacco, alcohol, coffee, tea or cola. Their food may be fortified with vitamins and minerals, and include a variety of preservative chem-

icals.

Some drugs act together with others to increase the effect of both. Some drugs act antagonistically with others to decrease the effect. Some of the over-the-counter, non-prescription drugs can be dangerous in high dosage, or in combinations with certain other drugs.

Sometimes middle-aged or an elderly citizen may exhibit bizarre behavior with confusion, requiring hospitalization. Say a person takes multiple drugs without proper supervision. His symptoms clear when he is detoxified. This amounts to legalized, inexpensive, widespread drug abuse among our middle-aged population. They are the parents of our youth. Reasons for drug usage are similar in both groups. The youth are more energetic and daring. They take greater risks and get involved with more dangerous drug traffic.

In a way, drug abuse may be compared with driving a car. Both young and middle-aged do it. Middle-aged people have learned to stay within the law. Energetic and daring young people do not hesitate to break the law. If they survive, they too become middle-aged and slow down. Our problem is to prevent them from hurting themselves or others, now.

Dynamics of Drug Abuse

Drug dependency means the psychological and/or physiological dependency on a drug arising in a person following repeated use of that drug on a continuous basis.



Dr. Britt

Drug addiction refers to the physiological dependency only.

People give different reasons for turning to the use of drugs. If the drug satisfies, that person may repeat the experience when the situation recurs. Repeated use of a drug, which affects the central nervous system, may lead to psychological dependency. The individual feels emotional discomfort when he cannot have the drug. This is easily recognized with such drugs as tobacco. The same is true to a greater extent with more powerful drugs. For this reason, powerful and medically useful drugs are controlled, while those without medical value are illegal.

Physiological dependency (drug addiction) may result from continued use of certain drugs. This means the body must have the drug in order to function proper-

ly. Uncomfortable or dangerous symptoms occur when the drug is withdrawn. This is particularly true with depressant-type drugs such as sedatives, alcohol, minor tranquilizers, and narcotics.

Classification

Drug dependency may range from the socially accepted cigarette habit, costing perhaps 25¢ a day, to the heroin habit costing hundreds of dollars per day.

Drugs of abuse may stimulate or depress the central nervous system to produce the desired effect. Stimulants, such as coffee and amphetamines, produce generalized C.N.S. stimulation, with alertness and a feeling of euphoria. The more powerful amphetamines, frequently misused to stay awake or control appetite, may lead to serious problems.

The hallucinagens, such as L. S. D., selectively, stimulate parts of the central nervous system, including the special senses. Sensory perceptions will be distorted. If other aspects of the individual and environment are favorable, he may experience a "good trip." If conditions are unfavorable, he may experience disaster. Marijuana may stimulate parts of the central nervous system and depress other parts. The minor tranquilizers, alcohol, antihistamines, and narcotics may selectively depress parts of the central nervous system. Each drug is specific for a certain pattern of depression. Sedatives produce generalized central nervous system depression to the point of sleep.

Public Health In Robeson County

A county health department might be described as a "department of community medicine" whose responsibility is to identify needs and initiate programs to improve the public health status of the community.

The definition was given by Dr. M. B. Pate, Robeson County health director, whose county was the second in the state to employ a full-time health director in 1912.

Primarily a rural county, Robeson has helped to set the pace in providing for the public health needs of its citizens. In land area it is the largest county in the state with a population of almost 85,000. Although composed of three races of nearly equal proportions, the citizenry is proud of its health department. Local appropriations account for \$214,000 of a total budget of \$282,000 for the present fiscal year—a whopping sum for a county whose basic industry is agriculture.

Does the largely non-white pop-

ulation situated in a rural environment create any particular public health problems? "Yes," says Dr. Pate, "primarily because the large numbers of people in various cultural groups increase the amount of work and analysis necessary to properly evaluate the public health problems within the county."

Dr. Pate allowed that it takes time to gather sufficient information to identify all the public health problems in a given community. He said it also takes a great deal of study before you can lump problems together in order to identify the total health needs of a particular section of the county or a segment of the population.

"We do not eradicate or substantially control disease by treating individuals," Dr. Pate explained. "It is true we might lower the incidence of disease and we might alter the characteristics of some diseases by treating individuals. All the diseases that we consider either eradicated or under control in this country were dealt with by either changing man's environment or changing his reaction to his environment. About the only area this has been achieved so far has been in immunization."

Dr. Pate noted that the main public health problems in Robeson County are venereal diseases, tuberculosis and hookworm. He said the greatest incidence of reported gonorrhea and tuberculosis is among the black race. Over a five-year period 110 blacks per 100,000 population fell victim to



" . . . baby is immunized against polio."

tuberculosis, against 30 for whites and 15 for Indians. The TB rate for blacks is about two times that of the state in general. Dr. Pate attributes the high TB rate among blacks to congestion (several people living in a single house and a single room), inadequate nutrition, poor housing and poverty. He revealed that about 15 percent of the rural population is infected with hookworms.

In addition to Dr. Pate, the Robeson County Health Department professional staff includes 10 nurses (seven assigned to environmental health), one health educator and three sanitarians—plus a backup corps of administrative personnel. It is expected that three additional nurses will be

hired during the coming year. "We have to have more help to expand existing programs and develop new ones," Dr. Pate said.

Eight clinics are held in the Robeson County Health Department at least once a month. An immunization clinic is held each morning at the health department and satellite clinics in seven of the county's 13 incorporated municipalities on alternate afternoons. These clinics are designed to serve the people who are without means of travel. In addition, family planning and maternal clinics are held each week, venereal disease and pediatric nurse screening clinics every two weeks and orthopedic and pediatric clinics once a month.

Scott Lauds Health Workers

Nearly 1,000 public health workers from across the state gathered recently in Winston-Salem for the 60th annual meeting of the N. C. Public Health Association.

Highlighting the four-day program was a speech by Gov. Bob Scott to a group of public health sanitarians attending the meeting.

Scott said that state government is destined to assume a "larger and more effective role" in protecting natural resources and the environment, as evidenced by the General Assembly's enactment of a Scott-sponsored environmental health legislative package.

This legislation provides for safeguards in the areas of water and air pollution control, resource management, coastal protection, electric utility site controls, oil pollution control, and visual environmental protection.

Scott said the state's role in protecting the environment will be strengthened by the Executive Reorganization Act of 1971 establishing a Department of Natural and Economic Resources, and by the legislature's authorization of a \$150 million clean water bond issue. The bonds will provide

grants to local governments to match federal assistance in building, enlarging, or improving public water and sewer facilities.

The governor lauded the work of public health sanitarians. "Until the recent surge of public interest in ecology, sanitarians stood virtually alone in insisting that our environment be maintained in a clean and sanitary manner," he said.

Also on the program were Dr. James R. Kimmey, executive director of the American Public Health Association (APHA) and state Senator Hargrove (Skipper) Bowles of Greensboro.

Kimmey defended the position of the APHA which has often been critized for being too radical. The association recently went on record as favoring an end to discrimination against women in health professions; the APHA has urged that federal and state drug laws clearly exclude marijuana from the classification of narcotic drugs, and it recommended a national health care program. The association also supports the repeal of restrictive abortion laws and advocates inclusion of abortion service in programs financed by both government and private resources.

Kimmey said, however, that the APHA's position is no real departure from the history of the association which was founded by health radicals in 1872. "Historically the APHA has been at the cutting edge in identifying problem areas in health care and doing



NCPHA OFFICERS 1971-72. (left) Miss Barbara Kahn, secretary; Miss Lydia Holley, president; Jesse Canady, president-elect; Miss Frances Sellers, vice president; and Mrs. Maxine Matheson, treasurer.

something about them.

"In the next few years the American people are going to see drastic changes in delivery and financing of health services. The APHA will be consolidating all its resources—both political and legislative—to do something about America's health problems," he stated.

Bowles expressed hope that one day the N. C. General Assembly would be able to fund all health programs needed by the state. At present, county governments supply approximately 86 percent of the money needed to support local health department programs.

The Watson S. Rankin Awards which recognize "outstanding accomplishments and continuing contributions of public health

workers in North Carolina" were presented to Dr. Robert Eugene Fox (posthumously) and Dr. Fred W. Mayes. Dr. Fox was past director of the Pitt County Health Department and a former director of the Community Health Division of the State Board of Health. Dr. Mayes was cited for his "acute sensitivity to the needs of North Carolina in his role as dean of the UNC School of Public Health."

The Carl V. Reynolds Award for outstanding contributions in public health in the last year was given to Dr. Marjorie O. Strawn, director of the Caldwell County Health Department. The award was presented in recognition of her "dedicated and imaginative leadership in the Caldwell County Health Department."

Influenza or "flu" has been with us for at least several hundred years even though the first influenza virus was not isolated from man until the 1930's. Those old enough to remember the widespread flu epidemic in 1917-1919 will recall the great number of lives lost—more than twice the number killed in World War I—and the panic it created. No single epidemic before or since has been so devastating.

Advances in the study of viruses that have taken place during the past few decades have permitted scientists to better characterize how influenza behaves. Since the first flu virus (type A) was isolated in the 1930's, another strain (type B) has been identified and a fairly definite pattern of virus activity has emerged. Type A viruses generally cause heavy outbreaks of influenza at two to three year intervals and type B viruses every four to six years.

Superimposed on this basic pattern has been a major change in the A virus at 10 to 11 year intervals so that the so-called A-1 virus first appeared in 1947, the A-2 or "Asian" virus in 1957, and the A-2/H.K. or "Hong Kong" virus in 1968. These major shifts in the A virus are associated with large influenza outbreaks which eventually circle the globe.

A somewhat predictable property of influenza is the "second-wave" phenomenon. Following the first onslaught of influenza A activity in association with a

Flu... Periodic Misery

By
Dr. J. N. MacCormack
Chief
Communicable Disease Section

major shift in the virus, a second and sometimes even a third "wave" of epidemic outbreak occurring several months after the first outbreak in a particular area is often seen. Both second and third waves were observed during the 1917-1919 pandemic, and second waves have occurred following the 1957 and 1968 shifts in the virus.

The periodic and somewhat unpredictable shifts in the influenza virus have complicated the manufacture of flu vaccine. Unlike most other vaccines which remain the same from year to year, influenza vaccine must be repeatedly changed as the virus changes. Each spring pharmaceutical companies that manufacture flu vaccine take note of the types of flu virus circulating and prepare their vaccine for the coming season accordingly.

Problems arise when the A virus decides to change character



Eggs are inoculated with seed flu virus. After two days of incubation, the veins at the top of each egg are inspected with an egg candler to see if the embryo is still alive. The eggs are then chilled to kill the embryos. At harvest (above) the top of the egg is sheared off and the virus is drawn out. The virus is then killed with a chemical and concentrated to form the vaccine.

after the vaccine is already prepared as occurred during the summer of 1968 when Hong Kong influenza first appeared in the United States in the late fall of 1968.

Who should take influenza vaccine? The U.S. Public Health Service Advisory Committee on Immunization Practices emphasizes that people subject to the greatest risk from serious complications of influenza should be first in line. This group includes those with chronic debilitating diseases such as congenital and rheumatic heart disease, arteriosclerotic and hypertensive heart disease, asthma, chronic bronchitis, cystic fibrosis, bronchiectasis, emphysema, advanced tuberculosis and diabetes. Older people in general should probably be immunized as well even if there is no recognized chronic disease present.

Assuming sufficient vaccine is available, consideration might be given to immunizing persons who provide essential community services such as policemen and school teachers. Industries often purchase vaccine for administration to their employees on the basis that it prevents loss of time from work because of influenza. Again, such use of flu vaccine is fine provided supplies to the group with greatest risk of serious complications from flu are not endangered.

What does the coming season hold in store for us? It should be pointed out that there is some influenza activity every year although some years are far worse than others. The last major type A outbreak occurred here in 1968-69 when the Hong Kong virus first appeared and there was a second wave during the winter of 1969-70. For the country as a whole, last winter was a fairly mild one for influenza in comparison with the previous two seasons; in North Carolina, the State Board of Health Laboratory isolated only a few type B influenza viruses from sick patients.

Thus, there is the distinct possibility that type A influenza may strike North Carolina again during the 1971-72 season, but it may not affect us severely again for another year since heavy years in the past have occurred at two to three year intervals. In any case, if you have a chronic medical condition, you are best advised to see your physician for your flu shot before the season arrives.



Dr. Baker

Gov. Scott

Scott Appoints Dr. Baker

Gov. Bob Scott recently announced at services dedicating the N. C. Medical Society's new headquarters building in Raleigh, the appointment of Dr. Lenox D. Baker of Durham secretary of the newly reorganized Department of Human Resources when it becomes operational.

The renowned Duke orthopedic surgeon and State Board of Health member will head a department comprised chiefly of the State Board of Health, the Department of Mental Health and the Department of Social Services. Scott said the department will be one of the

largest and most important in our reorganized state government.

The governor paid tribute to Dr. Baker as a man of character and ability—"one who, in his medical specialty, has few equals in the nation or, indeed, the world. The state is fortunate to be able to obtain his services," Scott said.

The Department of Human Resources is an outgrowth of the Executive Reorganization Act of 1971. Enacted under a mandate of the people, the act regroups departments and agencies into 17 principal departments along functional lines.

State Of North Carolina Vital Statistics Summary

	August 1971	Year to Date 1971
Births	8,516	63,505
Deaths	3,364	29,725
Infant Deaths (under 1 year)	150	1,401
Fetal Deaths (stillbirths)	130	998
Marriages	5,350	33,387
Divorces and Annulments	1,434	9,989
Deaths from Selected Causes		
Diseases of the heart (all forms)	1,215	10,845
Cancer (total)	552	4,394
Cancer of trachea, bronchus and lung	106	898
Cerebrovascular disease (includes stroke)	365	3,566
Accidents	260	2,160
Motor vehicle	146	1,116
All other	114	1,044
Diseases of early infancy	91	779
Influenza and pneumonia	56	875
Bronchitis, emphysema and asthma	45	449
Arteriosclerosis (hardening of arteries)	47	432
Hypertension (high blood pressure)	25	159
Diabetes	68	569
Suicide	45	399
Homicide	47	400
Cirrhosis of liver	56	387
Tuberculosis, all forms	15	73
Nephritis and nephrosis (certain kidney diseases)	18	197
Infections of kidney	22	181
Enteritis and other diarrheal diseases (stomach and bowel inflammations)	5	61
Ulcer of stomach and duodenum	18	80
Complications of pregnancy and childbirth	2	21
Congenital malformations	43	319
Infectious hepatitis	1	12
All other causes	368	3,367

Marriages, divorces and annulments are by place of occurrence, all other data are by place of residence.



"Well it's finally happened, doctor—you're booked up for the rest of your life."

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On the Cover

The stroke victim is taught, with the aid of household facilities similar to those found at home, to function to the limit of his capabilities. Many times this is as good as before the illness occurred. Patients re-learn to plan and cook meals, make beds, vacuum, and iron. They also do electronics, repair appliances and do woodwork. The hospital occupational therapy department, however, is primarily concerned with identifying assets and establishing a program of treatment that may be pursued on an outpatient basis.

COMMENT

Home Health Services "helps"



Dr. Grant

By
Dr. Isa Grant
Chief
Chronic Disease Section

The little girl in a cast, a teacher who has been in an automobile accident, a mother who is recovering from cancer, a grandfather who has had a stroke all have something in common. They are happier at home and their recovery is faster. Home health services can best allow this choice. Medicaid, Medicare and many other insurance programs provide financial help where services are up to standard. We now have good information on how such services can operate, along with part-time manpower in all communities. But in North Carolina many communities have not taken the first step in getting such services. Home health services are those that provide for the patient to receive continuing care at home where necessary. It is as varied as people's needs and uses a variety of health professionals: physicians, nurses, physical therapists, occupational therapists, speech therapists, medical social workers, nutritionists, home health aides and others. The State Medical Society and other professional organizations have made its development a top priority. The question is not the need that is well established in each community but the difficulty in taking the first step. Expressed differently, the thought and word are there but the deed is yet to be done. The first step can be taken by any interested citizen, local health departments, local hospital authorities, nursing agencies, private physicians, retirement associations, civic clubs or others. The first step is saying you want home health services by calling or writing your regional public health office or our own Chronic Disease Section.

Hiatus Hernia

. . . Pain In the Chest, Back, Neck, Stomach, etc.

By
Dr. Sylvester Vala
Physician Consultant
Chronic Disease Section

Have you ever been awakened during the night with dull cramp-like pain behind your chestbone—extending perhaps to the neck and to the back between the shoulders?

It was no doubt a frightening experience. Your first thought probably was: Is this a heart attack? Am I going to be able to get to the doctor in time? Deciding to tough it out 'til morning, you slept only fitfully the rest of the night.

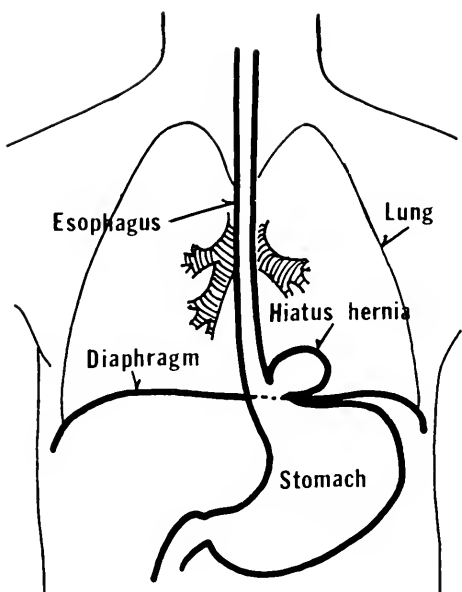
The condition, though not usually requiring emergency treatment, can tyrannize sufferers night after night exhibiting such symptoms as chest pain, heart palpitations (quivering of the heart), burning in the throat, hiccups, belching and a general feeling of discomfort. Symptoms are sometimes accompanied by anxiety and nervous

tension which, combined, may closely parallel symptoms of a heart attack.

Generally, however, we are not dealing with a heart attack but with a condition known as a hiatus hernia. What is a hiatus hernia? Below the lungs is a layer of muscle called the diaphragm which acts as a partition between the chest cavity and the abdomen. The esophagus (food passageway) passes through the diaphragm to reach the stomach. Sometimes a tear occurs at a juncture where the esophagus passes through the diaphragm allowing part of the upper stomach to slide up through the opening into the chest cavity. It has been noted that a small tear is sometimes more painful than a large one.

So, you have a hiatus hernia. What is this nagging and sometimes painful condition? The condition interferes with the performance of the sphincter muscle located at the end of the esophagus. Part of the function of the sphincter is to prevent digestive juices in the stomach from splashing backward into the esophagus—an area not designed by nature to accommodate them. When digestive juices escape into the esophagus it causes irritation—heartburn. Constant irritation may cause a bleeding ulcer. A sufferer may also experience difficulty in swallowing. Such symptoms are also similar to cancer and should be properly evaluated.

Pain from a hiatus hernia does not always stay in the same area.



As noted earlier a dull ache is often felt under the chest bone—spreading to the back. Sometimes, pain is experienced in the lower chest on the left side, since the esophagus passes through the diaphragm at a point a little to the left of center. One of the reasons the condition often mimics heart trouble is pressure in the chest caused by bloating. You no doubt have reasoned by now that belching usually accompanies an onset.

What causes a hiatus hernia? It is impossible to pinpoint a single "cause." Hiatus hernia has been related to obesity, nervous tension, congenital weakness in the affected area, repeated pregnancy, severe blows against the abdomen, and wearing a tight girdle or belt.

Diagnosis is usually made by using a special X-ray technique. The patient is asked to drink a

liquid (barium swallow) which will outline the esophagus and stomach. As the fluid is swallowed the patient is gradually tilted backward while a series of X-rays is taken during various stages of the process. If a tear is present in the diaphragm, it usually can be detected as pressure is applied as the body is tilted backward causing part of the upper stomach to squeeze through the tear.

A person with a hiatus hernia should avoid acid foods and eat a small amount at suppertime. He should also avoid carrying heavy objects. Most people with a hiatus hernia weigh too much and should lose weight. Since the problem arises mostly at night, the head of the bed should be elevated four to six inches to prevent stomach juices from running backwards into the esophagus. A unique medication is now being used to treat hiatus hernia patients. It comes in the form of a tablet that is chewed but not swallowed. An antacid foam will form, descend down the throat and remain floating on the fluid level in the stomach. It is effective in relieving heartburn. Of course, there are many antacids on the market capable of soothing the stomach and keeping acid to a minimum.

Sometimes a hiatus hernia is difficult to treat in a conservative manner leaving surgery as the only alternative. The procedure consists of closing the tear in the diaphragm so that the upper part of the stomach cannot slide through into the chest cavity.

Situated in a wing on the first floor of Memorial Hospital in Chapel Hill is a most unusual department for the treatment of patients—Occupational Therapy.

To the casual observer it would be a little difficult to relate its activity and its atmosphere to that of a hospital. There is a healthy aroma about the place — no sick odors. The aroma of food being cooked drifts across the room. The smell of leather and shellac greets visitors. If a person listens closely

Occupational Therapy . . . a search for assets

he might hear the whine of a buzz saw in the woodwork shop.

The type of patients referred to occupational therapy are those whose ailments have created problems adjusting to daily living. Some have chronic conditions with which they must live the rest of their lives. Others may have acute problems that can be corrected with drugs or surgery. It is the job of the occupational therapist to identify problems that might hinder adjustment and mobilize the patient's strengths so that he might live productively despite his disability.

Miss Florence Bearden, who heads the department, instructs patients with a wide range of illnesses — from stroke victims to young children with coordination problems. There is help, for instance, for the delicate young 12-year-old with cystic fibrosis. She must be assured that mild exertion will not bring an onset of uncontrollable coughing. The young man with non-functioning kidneys, whose life depends upon periodic dialysis, is given an opportunity to let off anger at the OT staff. Miss Bearden explained that such patients are sometimes afraid to let off anger at ward personnel, on whom they are almost totally dependent, for fear they will stop taking care of them.

Miss Bearden and her staff of nine give each new patient a battery of tests—the exact nature of which depends upon the type of illness involved. Stroke and rheumatoid arthritis victims are by far the highest diagnostic categories treated. Miss Bearden pointed out that many stroke patients have eating problems. "Our eating program includes having a whole group of stroke patients down two to three times a week for family-style lunches. They are confronted with the same problems they will find at home in so far as eating is concerned." The exuberant occupational therapist said that training stroke patients to learn new things or to do old things in a new way is often difficult. She said many patients, having lost the use of an arm, may carry on a



Miss Bearden aids a stroke victim in re-learning the bed-making process.

brilliant conversation, but eat off the plate of the person next to them because they have perceptual problems.

North Carolina ranks third in the nation in incidence of strokes. For some reason such vascular accidents are more common in the eastern part of the state. Noting the frequency with which the ailment strikes, Miss Bearden thinks it's important for families involved to be educated to the fact that the patient is now different in some ways. "Do not hide them in back rooms as is still being done in some instances," she said.

Miss Bearden said rheumatoid arthritics have many problems adapting to long-term pain. "We attempt to learn their daily routine and whether or not it is doing further damage to their joints. We provide special devices which

make life a little easier, but mostly we try to teach them to live with their disability despite pain. Since we only have an average of four and one-half hours per patient, our main goal is to identify the problem and pass the rehabilitation process (which could take years) on to someone else on an out-patient basis."

Miss Bearden contends that everyone has to be taught to work. "A person is not automatically programmed to work just because he has turned 18. There are many people with chronic problems who are marginal workers from the beginning. Some of our third generation welfare people have never learned to work because they have never seen anybody work. When they get a chronic condition they don't know how to be problem-solvers, or creative people."

Respiratory Diseases . . .

A Plague on The Disabled Living

America is experiencing a whopping increase in chronic respiratory diseases.

Latest count totals over two million sufferers with some estimates ranging as high as 14 million, according to Dr. Edward Buckley, director of the Allergy and Clinical Immunology Laboratory at Duke University Medical Center.

Dr. Buckley stated that spiraling statistics are direct products of the 20th century—widespread cigarette smoking; air pollution resulting from poorly planned industrialization of rural regions; booming population growth and increased crowding in urban areas; and the past unwillingness of the business man and the public to protect the environment. “However, the future is not all bleak,” he said. “We have profited from past mistakes. Public demand will be necessary to cause needed changes in the attitudes of responsive political leaders.”

Chronic respiratory diseases are caused by infectious substances breathed into the lungs, Dr. Buckley revealed. This includes environmental pollution from vehicle exhaust fumes (source of most pollution) and gaseous emissions

from industrial smokestacks. Another major factor is personal pollutants — harmful substances to which man intentionally exposes himself. “Cigarette smoke can be placed in this category, along with air pollutants encountered in certain occupations such as coal mining, cotton mills, and pollutants from asbestos fibers. We are less concerned about irritating environmental pollutants, which people will avoid, than those which cause harm without symptoms,” Dr. Buckley said.

“People run a higher risk of exposure to irritants and infections today because of overcrowding. More and more people are being drawn to areas of high population density seeking better paying jobs and a higher standard of living. The end result is more cars, more people, more industry, more pollution. In such settings people run a greater hazard of pollution, and a greater chance of developing chronic respiratory diseases.

“The lung is the major organ exposed to man’s external environment. When harmful pollutants are unknowingly breathed into the lungs for a long enough time, a disability-producing chron-

ic respiratory disease will often develop."

How Breathing Works

To understand chronic respiratory disease, Dr. Buckley said that it is necessary to know how the respiratory system functions. The lungs provide oxygen to the blood which in turn supplies all body cells. Cells use the oxygen and give off carbon dioxide, which is carried by the blood to the lungs and exhaled.

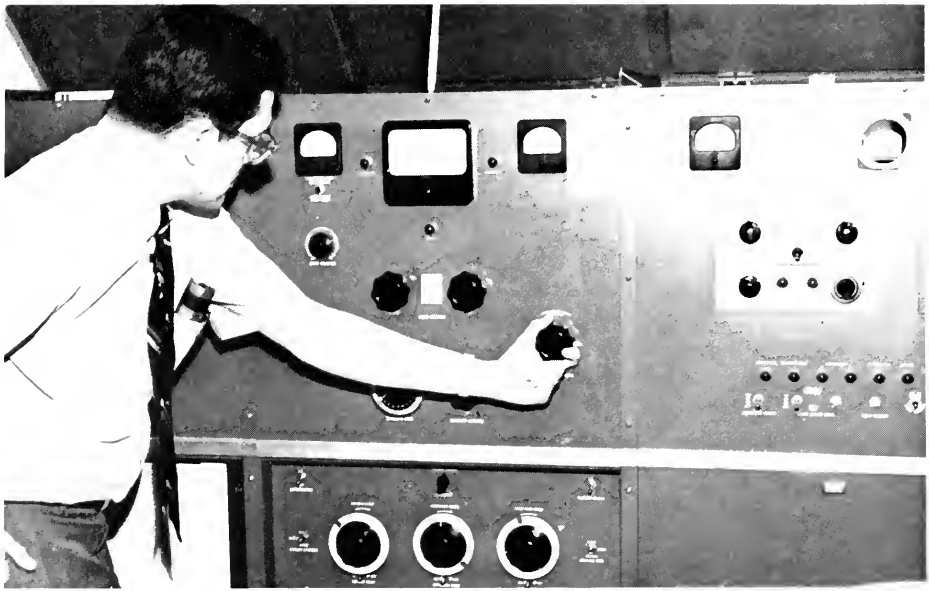
He explained that the exchange of oxygen and carbon dioxide is accomplished in this manner—air is breathed through the nose into the trachea (windpipe). The trachea divides into two branches high in the chest and forms the right and left bronchi (breathing tubes). Each bronchus divides and subdivides many times into smaller air tubes (bronchioles) which reach all parts of the lungs. At the end of each bronchiole is a tiny air sac, the alveolus. Each lung contains approximately 750 million of these microscopic, balloon-like alveoli. Each alveolus has a thin transparent membrane. Blood can be seen flowing through the capillaries (smallest blood vessels) which surround each alveolus. When the alveoli fill with air on breathing in (inspiring), oxygen passes through the membrane and capillary wall, and is picked up by the red cells of the blood. Oxygenated blood is carried throughout the body to provide nourishment for all body cells.

The Duke lung specialist noted

that for protection a filtering mechanism is built into the respiratory system. The nose is the initial filter. "Hair and mucus membranes in the nose trap some particles, such as bacteria and dust, before they reach the lungs," he said. "The large air passages to the lungs, the bronchi, are also lined with mucus glands which secrete small amounts of mucus each day. Tiny, rhythmically sweeping hairs (cilia) move the mucus from deep within bronchial tubes to the throat where it is swallowed. As the mucus moves, it cleanses air passages and provides a protective coating against inhaled particles and harmful pollutants.

"Tobacco smoke and many other air pollutants paralyze the cilia and cause increased mucus production. This leaves the lungs defenseless against harmful agents and can lead to chronic infection and inflammation in the bronchi—chronic bronchitis. Immunologic mechanisms are important in the protection of the lungs and bronchi against tissue destruction caused by chronic infection and inflammation. Tissue destruction leads to emphysema (departitioning or ballooning) and fibrosis (scarring).

"The same immunologic mechanism (allergies or hypersensitivity reactions) also causes the symptoms by which lung disease is recognized — cough, increased mucus production, wheezing, shortness of breath. When symptoms occur, this means the body



Dr. Buckley checks the gauges on an analytical ultracentrifuge in the Allergy and Clinical Immunology Laboratory at Duke University. The utensil is used to study antibodies and other protein molecules important in the body's immune defense mechanisms against destructive lung disease.

has found it necessary to protect the lungs against some harmful agent. Lung destruction and continued disease occur when immunologic mechanisms are unable to protect the lung. Certain kinds of hypersensitivity reactions, if allowed to continue, can even harm the lung in futile attempts to protect against harmful external agents. Pollutants which can be eliminated from the lung only at the expense of excessive tissue destruction—such as some infectious agents—cause severe lung disease. The identification of the most beneficial protective mechanism, the genetic factors important in protection against severe lung damage, and ways to clinically manage the immune response is the primary goal of our research,”

Dr. Buckley said.

There are three major chronic respiratory diseases — asthma, chronic bronchitis and emphysema. Asthma is the only one of the three with a declining mortality rate. Asthma mortality decreased 30 percent from 1958 to 1967. According to Dr. Buckley, this change probably reflects the medical profession's increased awareness of the disease and its ability to effectively diagnose and treat asthma. Chronic bronchitis and emphysema account for 71 percent of deaths from chronic respiratory diseases.

Asthma results in attacks of difficult breathing usually brought on by exposure to specific products of the environment, such as pollens, dusts, or animal dander.

During an attack, the bronchial tubes go into a spasm and contract and excessive mucus may block the bronchi. This causes the victim to be unable to breathe without great effort. Drugs can quickly relax the bronchi and improve breathing. Asthma causes severe symptoms, but less lung destruction than bronchitis and emphysema.

Dr. Buckley considers asthma a reversible form of lung injury. "The person can often avoid the factors that cause the attacks. With good care and treatment, the asthma sufferer can function normally," he said.

"Bronchitis and emphysema are more apt to produce severe and irreversible disability. Chronic bronchitis is inflammation of the large air passages or bronchi. The lining of the airways swells, secretions increase, and air passages become narrower. Continued inflammation and infection can lead to destruction of the small air passages and air sacs. Continued lung damage can lead to permanent shortness of breath, overload the heart, and increase susceptibility to other diseases. Patients with chronic bronchitis often have a rasping morning cough and produce green or yellow sputum. The congested air tubes require more effort to breathe, and cause shortness of breath. Four major factors contribute to bronchitis: smoking, infection, air pollution and hypersensitivity reaction.

"Emphysema (Greek for inflated) is a lung condition in which

the lungs become enlarged, contract poorly, and air exchange becomes difficult. This results from destruction of the alveolar walls. Tiny holes called fenestrations form in the alveolar membrane, eventually enlarge, form large tears, rupture and lose their elasticity. As this process continues, less membrane area is available for gas exchange with the lung capillary blood. The body lacks oxygen nourishment. Because of decreased ability to collapse the lung during expiration (breathing out), the victim has to work harder to exchange sufficient air to support life. Because of constant overexpansion of the lungs, a barrel-shaped chest frequently results. The main symptoms of emphysema are shortness of breath on exertion, chronic cough and some wheezing.

"The exact cause of emphysema is not known, but the death rate from chronic bronchitis and emphysema is six times greater for smokers than non-smokers. Also, emphysema hits six times more men than women, although the incidence rate for women is rising.

"By detecting chronic respiratory disease in the early stages, the disease can often be arrested and disability prevented. Many forms of asthma and bronchitis can be reversed if diagnosed and treated in the early stages. Public education is the key to early detection. If people are aware of the problem, they will seek medical help before disability becomes severe," Dr. Buckley stated.

Carbon Monoxide . . . Invisible Death

Carbon monoxide gas is invisible, odorless, tasteless and deadly.

Approximately 1,500 persons die in the United States each year as a direct result of being exposed to carbon monoxide gas. Over 10,000 are exposed to the extent of requiring medical care or causing at least one or more days of restricted activity.

Carbon monoxide gas caused 40 deaths in North Carolina in 1970, 27 accidents, 12 suicides and one homicide.

Carbon monoxide is produced whenever fuels are burned. It is colorless and extremely poisonous. Unlike other gases, it does not tickle the throat nor cause your eyes to smart. In fact, it does not make its presence known in any way.

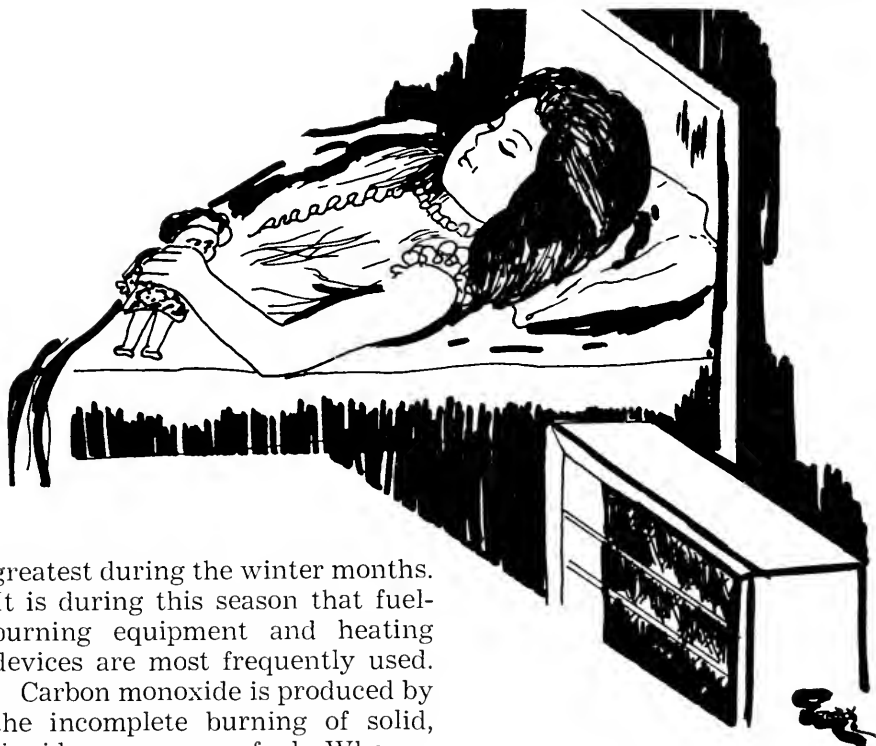
Carbon monoxide cuts off the oxygen or fresh air supply from the tissues of the body. In mild doses, carbon monoxide will cause a headache, dizziness, vomiting and sleepiness. With continued exposure it will cause shortness of

breath, convulsions, unconsciousness and finally coma and possibly death. Age is no barrier. Young and active children are easy victims. The old and the infirm find it very difficult to recover from its effects. This is particularly true of people of any age who suffer from anemia, heart disease or poor circulation.

The reported number of deaths and injured are believed to be only the "tip of the iceberg." Public health and medical authorities believe there are many more injuries and deaths from carbon monoxide poisoning but are not being reported as such because carbon monoxide is not suspected and may not be recognized. Fatal or near fatal deaths from this cause have received preliminary diagnoses of acute alcoholism, cardiac failure, botulism, viral infection and others.

In addition to acute carbon monoxide poisoning resulting in death, considerable danger lies in daily exposure to low concentrations or carbon monoxide in the home environment. A person so exposed for prolonged periods may experience headaches, dizzy spells, anemia, weakness, mental depression, nervousness, irritability and circulatory impairment.

Although most of us are exposed to carbon monoxide every day through such sources as stoves burning gas, wood, coal, or oil, gas refrigerators, gas-fired dryers, space heaters and even cigarettes and in the cars in which we are riding, the hazards of this gas are



greatest during the winter months. It is during this season that fuel-burning equipment and heating devices are most frequently used.

Carbon monoxide is produced by the incomplete burning of solid, liquid, or gaseous fuel. When a person is exposed to the gas in a place without adequate ventilation, poisoning occurs, sometimes quickly.

Carbon monoxide poisoning is absolutely preventable. Accidental illness and death from this "silent killer" can be greatly reduced by complying with the following:

- Buy only equipment that complies with your local code. Otherwise, look for the certification seal of one of the national testing agencies.
- Make sure your fuel-burning equipment is installed by a qualified person.
- Provide a constant supply of fresh air to provide safe com-

bustion and a positive method of venting the burned gases.

- All fuel-burning devices should be given a thorough inspection and maintenance at least once a year.
- Never use a charcoal grill indoors for the purpose of cooking, heating or taking the chill off a particular room such as a basement or closed garage.
- An automobile engine should never be left running in a closed garage.
- Know and understand the symptoms of carbon monoxide poisoning, as it is a great imitator of other illnesses.

Health Board Elects Officers



Dr. Charles T. Barker
Exec. Comm.



Dr. James Raper
President



Dr. Paul F. Maness
Vice President



Dr. James Meredith
Exec. Comm.

Health Board Action

The North Carolina State Board of Health held its regular quarterly meeting October 28, 1971, at the Blockade Runner in Wrightsville Beach, and took action on the following rules and regulations:

- Passed regulations governing standards for design and construction of public water supply systems.
- Passed rules and regulations governing mass gatherings.
- Passed regulations governing certificate of need for nursing

home facilities.

- Passed regulations governing licensing of home health agencies.
- Passed regulations governing revisions of nursing home regulations.
- Repealed regulations requiring health cards for food handlers.

Copies of the above rules and regulations may be obtained by submitting a request to the N. C. State Board of Health, Raleigh, N. C.

State Of North Carolina Vital Statistics Summary

	Sept. 1971	Year to Date
Births	8,717	72,222
Deaths	3,705	33,430
Infant Deaths (under 1 year)	181	1,582
Fetal Deaths (stillbirths)	140	1,138
Marriages	3,756	37,143
Divorces and Annulments	1,566	11,555
Deaths from Selected Causes		
Diseases of the heart (all forms)	1,309	12,154
Cancer (total)	596	4,990
Cancer of trachea, bronchus and lung	112	1,010
Cerebrovascular disease (includes stroke)	406	3,972
Accidents	319	2,479
Motor vehicle	189	1,305
All other	130	1,174
Diseases of early infancy	106	885
Influenza and pneumonia	106	981
Bronchitis, emphysema and asthma	51	500
Arteriosclerosis (hardening of arteries)	40	472
Hypertension (high blood pressure)	18	177
Diabetes	73	642
Suicide	45	444
Homicide	65	465
Cirrhosis of liver	49	436
Tuberculosis, all forms	8	81
Nephritis and nephrosis (certain kidney diseases)	25	222
Infections of kidney	19	200
Enteritis and other diarrheal diseases (stomach and bowel inflammations)	6	67
Ulcer of stomach and duodenum	11	91
Complications of pregnancy and childbirth	4	25
Congenital malformations	35	354
Infectious hepatitis	4	16
All other causes	410	3,777

Marriages, divorces and annulments are by place of occurrence, all other data are by place of residence.

High Flight

*Oh, I have slipped the surly bonds
of earth
And danced the skies on laugh-
ter-silvered wings;
Sunward I've climbed, and joined
the tumbling mirth
Of sun-split clouds—and done a
hundred things
You have not dreamed of—wheeled
and soared and swung
High in the sunlit silence. Hov'r-
ing there,
I've chased the shouting wind a-
long, and flung
My eager craft through footless*

*halls of air.
Up, up the long, delirious, burning
blue
I've topped the windswept
heights with easy grace
Where never lark, or even eagle
flew.
And, while with silent, lifting
mind I've trod
The high untrespassed sanctity of
space,
Put out my hand, and touched
the face of God.*

By John Gillespie Magee, Jr.

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